

Remedial Investigation Report For 903 Pad, Mound, and East Trenches Areas

Volume II

US DEPARTMENT OF ENERGY Rocky Flats Plant Golden Colorado

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ADMIN REC

40 WASTE SOURCES CHARACTERIZATION

This section presents data from investigations of the waste storage and disposal areas at the 903 Pad Mound and East Trenches Areas Waste quantities location and composition are presented Concentrations of hazardous substances and radionuclides identified above background levels are also provided along with other physical and chemical data

This investigation focused on source characterization of past waste disposal sites (SWMUs) as preliminarily identified and located for the RCRA Part B Permit Application (Rockwell International 1986a) and the CEARP Phase I report (DOE 1986b) SWMU locations are herein revised and/or verified based on the additional data collected during this investigation. Plate 4.1 presents the revised SWMU locations

Characterization of SWMUs is based on information regarding historical waste management practices and on data collected during the 1986 and 1987 field investigation programs. Soil samples are the major source of data but soil gas samples ground water and surface water samples are also considered in characterizing the SWMUs. Plate 4.2 shows soil gas sample locations and Plates 4.3.4.4.5.4.6 and 4.7 present soil gas data for tetrachloroethene (PCE) trichloroethene (TCE) carbon tetrachloride (CCl₄). Il 1 trichloroethane (1.1.1.TCA) and 1.1. dichloroethene (DCE) respectively. Soil samples collected in 1987 have been analyzed for the parameters listed in Table 4.1. Selection of borehole locations is discussed in Appendix D.

TABLE 4 1

SOURCE SAMPLING PARAMETERS, SOIL AND WASTE SAMPLES

Metals

Hazardous Substance List Metals
Beryllium
Chromium (hexavalent)
Lithium
Strontium

Organics

Hazardous Substances List Oil and Grease

Radionuclides

Gross Alpha
Gross Beta
Uranium 233 234 and 238
Americium 241
Plutonium 239
Strontium 90
Cesium 137
Tritium

Other

Characteristics (e g ignitability corrosivity reactivity) pH

In order to facilitate a clear and concise discussion of soil contamination at the various SWMUs in the 903 Pad Mound and East Trenches Areas observations pertaining to uranium and trace metals and some organics are summarily discussed here. Many of the organics detected in the samples are considered to represent laboratory artifact and examination of all the data indicates uranium and trace metals are not contaminants of the soils.

The presence of Hazardous Substance List (HSL) organics in soil samples at concentrations above detection limits are indicative of contamination provided these organics are not present in laboratory blanks for the samples. Such data are discussed under the SWMU subsections. However, the presence of an HSL organic in a laboratory blank and sample does not necessarily imply laboratory artifact if the concentration in the sample greatly exceeded the laboratory blank concentration. For some soil samples collected for this investigation, this has been the case and these data are also discussed under the SWMU subsections. Conversely, there are many samples for which HSL organics are present at concentrations on the same order as those found in the blanks. These data are discussed below.

Analytical data for most of the soil samples collected for this investigation indicate the presence of methylene chloride acetone and bis(2 ethylhexyl)phthalate and occasionally 2 butanone N nitrosodiphenylamine di n octyl phthalate and di n butyl phthalate. The analytical data are shown in Tables 4 2 and 4 3. Inspection of the data indicates the following methylene chloride generally was present at low or estimated (below detection limit) concentrations and often appeared in the blanks acetone was almost always detected in the blanks and its occurrence in samples was often at concentrations within a factor of 2 to 3 of that observed in the blanks 2 butanone was generally present in samples only at estimated concentrations below

TABLE 4 2
VOLATILE ORGANICS IN SOILS
POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION
(ug/kg)

2-Butanone

Acetone

Methylene Chloride

Sample Number

Field

RFW Batch

	slow detection limit hk mit of 50 mg/kg)	ed 1	Notes J Estimate B Present
က	30	BH128702CT	8705-059-0010
Ω	25	BLANK	8705 059-0001BL
		* *	** Batch 8705-059 *
	49 B	BH028714CT	8705-057 0130
		BH02871420	
		BH07871013	
		BH078705CT	8705-057 0070
		BHO78710WS	8705 057-0030
		BH07870BR	ı
		BLANK	8705-057-0002BL
		BLANK	8705 057-0001BL
		**	** Batch 8705 057 *
124 B	32 B	BH30870010	3122 471-017
28	37	BH37870005D	-471
20 (BH37870005	-471
, ,		RH96870003	471 -471-
		BHZ487IOWS	3122 471 012
		BH24870002	471-
		BH24870002	011-
		BH24870002	
1	14	BH098711CT	600
15	10	BH098711CT	
+ · · ·	0 -	BH140/03BK	122 4/1 008
20 •	Z- (**)	BH148702W1	122-471 007
78	36	BH028718BR	122-471 006
18	23	BH02870012	3122-471-005
22	28	BH138711CT	22 471-004
85	27	BH148206CT	1
100	4.8	BH148708W2	3122-471 002
		27 28 29 29 36 47 47 48 38 30 47 47 48 38 47 48 48 48 49 40 40 40 40 40 40 40 40 40 40	1148206CT 27 28 22 22 22 23 35 35 36 36 36 36 36 36 36 36 36 36 36 36 36

TABLE 4 2	VOLATILE ORGANICS IN SOILS	POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION	(119/10)
		POSSIBLY #	

RFW Batch 1D	Field Sample Number	Methylene Chloride	Acetone	2 Butanone
8705 059 0030	BH128705BR	130 B	66 B	27.0
USS UUSUMS			2	3
** Batch 8706-002	****			
8706 002-0001BL	BLANK	10 J	145	06.
8706-002-0030	BH098/145K BH098706WT	ညာ ထာ ထား တ	280 B 110 B	390
8706 002 0050	BH09870010	39 B		
8706 002 0050MS	BH09870010 MS			
** Batch 8706 004	**			
8706 004 0001BL	BLANK	10 Ј	145	
		_	-	
8706 004-0010MS	BH13870010 MS			150
	GW287BH03	40 B 35 B	65 B	
** Batch 8706-005	*			
	BLANK			•
002	BH08723BR	26 B		1 ;
8706 005 0010MS	BH08723BR MS	6 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	71 B	16
005	BH10870010			, ,
002	BH108720CT	36 B	150 B	
** Batch 8706 010	**			
8706 010 0001BL	BLANK	25 J	20 J	ŧ
010	BH118711CT	35 B		
	BH118714WT			
010-	BH11870010		180 B	
8706 010 003035	Brits/0010 ms	44. c.	30 P	110
010	BH168702CT			
010	BH16870206	46 B	75 B	ı
** Batch 8706 014	**			
8706 014 0001BL	BLANK	5 5	35 J	
Notes J Estin	Estimated concentration below Present in laboratory blank	detection limit		
	Not detected (detection limit Not analyzed	of 50 ug/kg)		
Not	spiked			

TABLE 4 2
VOLATILE ORGANICS IN SOILS
POSSIBLY AFTRIBUTABLE TO LABORATORY CONTAMINATION

## Street of the concentration below detection limit ## Street of the concentration limit of 50 ug/kg) ## Street of the concentration limit ## Street of the concentrati	RFW Batch ID	Field Sample Number	Methylene Chloride	Acetone	2-Butanon
19 19 19 19 19 19 19 19					
December 19 JB 250 B 100 D 1	014	BLANK			.,
00500 BH10870007 12 B 39 JB 005008 BH10870007 12 B 19 JB 19	014	BH178708BR			13
00500 BH178705CT H5 19 JB 110 B 100 00700 BH178705CT H5 29 JB 31 JB 110 B 00900 BH178705CT H5 29 JB 31 JB 110 B 00900 BH178706B 19 JB 31 JB 110 B 01100 BH178706B 19 JB 31 JB 110 B 01100 BH178706B 19 JB 46 JB 110 B 01100 BH178706B 19 JB 46 JB 110 B 01100 BH178706B 19 JB 40 JB 40 JB 110 B 01100 BH178706B 10 JB 40 JB 40 JB 110 B 01100 BH178706B 10 JB 40 JB 40 JB 110 B 01100 BH178710WS MS 10 JB 40 JB 110 B 0100 BH178710WT B 11 JB 20 JB 110 B 0100 BH178710WT B 11 JB 20 JB 110 B 0100 BH1787710WT B 11 JB 20 JB 110 B 0100 BH1787710WT B 11 JB 20 JB 110 B 0100 BH1787710WT B 11 JB 20 JB 110 B 0100 BH1787710WT B 11 JB 20 JB 110 B 0100 BH1787710WT B 11 JB 430 B 0100 BH1787710WT B 11 JB 440 JB A 0100 BH1787710WT B 11 JB 430 B 0100 BH178710WT B 11 JB 440 B 0100 BH		BH08870007			
0000 BH108700CT MS 26 B 110 B 110 B 10000 BH108700CT MS 26 B 110 BH1087000C	8706 014 0050				
0000 BH1587005 19 JB 31 JB 0010 BH1587056 19 JB 31 JB 31 JB 0010 BH1587056 19 JB 31 JB 31 JB 0110 BH15870510 19 JB 48 JB 78 JB	8706-014 0050MS				
0100 BH158726BR 37 B 48 JB 0130 BH15870005 19 JB 18 JB 48 JB 0150 BH15870005 19 JB 18 JB 48 JB 0150 BH15870005 19 JB 18 JB 48 JB 0150 BH15870010 BH15870010 BH15870010 BH15870010 BH15870010 BH15870010 BH158701WT 10 JB 400 B 11 00010 BH1018710WS MS 10 JB 400 B 11 00050 BH1018710WS MS 10 JB 400 B 11 00000 BH1018710WS MS 10 JB 400 B 11 00010 BH1018710WS MS 10 JB 10 00010 BH1018710WS MS 10 JB 10 00010 BH1018710WS MS 10 JB 10 JB 10 0000 BH1018710WT 10 JB 20 JB 10 0000 BH1018710WT 10 JB 20 JB 10 0000 BH1018710WT 10 JB 400 BH1018710WT 10 JB 430 BH10187	,	BHU88707CT			
0110 BH18870068 19 J 78 J 7		BH17870005			
March Marc	17.	BH158/20BK			
March Marc	-014	BH088710BR	-		,
8706 022 ** 00010LL BLANK 00010 BH018701WT 0010 BH018701WT 0010 BH018701WT 0000 BH018701WT 0000 BH018710WS MS 0050MS 0060 BH018710WS MS 0010 BH048719BR 0010 BH048719BR MS 0020 BH048715CT 0010 BH048715CT 0010 BH048715CT 0010 BH048710WT 0020 BH048710WT 0020 BH048710WT 0020 BH048710WT 0020 BH048710WT 0020 BH028717WT 0001BL 0616 BLANK 00070 BH298717WT 0001BL 0616 BLANK 00070 BH298717WT 0001BL 0616 CALANK 00070 BH298717WT 00070		BH15870510			
0001BL BLANK 00010 BH018701WT 10 JB 400 B 00050 BH018701WT 10 JB 400 B 00050 BH018710WS MS 10 JB 470 B 00050 BH018710WS MS 16 J 750 B 00010 BH048719BR S 22 JB 650 B 00100 BH048719BR MS 22 JB 1100 B 00100 BH048710WT 17 JB 200 B 00000 BH048710WT 16 JB 490 B 00000 BH29870010 9 J 53 B 00000 BH29870010 9 J 53 B 00000 BH298770WT 10 J J 17 B 00001BL 0616 BLANK 6/23 40 J 00001BL 0660 BH298713CT 11 JB 430 B 00000 BH298713CT 11 JB 170 B 00001BL 0616 BLANK 6/23 40 J 00001BL 0616 Gtection limit of 50 ug/kg)	Batch 8706 022	**			
0000 BH0018701WT 10 JB 400 B 0000 BH0018701WS MS 12 JB 400 B 400 B 10 JB		BLANK		0	
BHO187104WS 12 JB 400 B		BH018701WT			1
00560 BH018710WS MS 10 JB 470 B 8706 024 ** 8706 024 ** 8706 024 ** 8706 024 ** 00010 BH048719BR S 22 JB 660 B 0010 BH048719BR MS 22 JB 110 B 0010MS BH048719BR MS 22 JB 650 B 0010MS BH048710WT 17 JB 200 B 0040 BH048710WT 16 JB 490 B 8706 042 ** 0001BL 0616 BLANK 9 J 53 B 0050 BH298717WT 10 J 430 B 0050 BH298717WT 10 J 430 B 8706 058 ** 0001BL BLANK 6/23 - 40 J	8706 022 0030	BH018704WS			
8706 024 ** 8706 024 ** 8706 024 ** 9001BL BLANK BH048719BR S 23 JB 1100 B 5010 BH048719BR S 23 JB 1100 B 650 B 60010 BH048710BT S 23 JB 1100 B 60020 60030 BH048710WT 16 JB 350 B 60040 BH048710WT 16 JB 490 B 8706 042 ** 8706 042 ** 8706 042 ** 8706 042 ** 8706 058 BH298710WT 10 J 430 B 60070 BH298710WT 10 J 430 B 60070 BH298710WT 10 J 430 B 60070 BH298713CT 11 J 430 B 60070 BH298713CT 11 J 440 J 6001BL BLANK 6/23 40 J 6001BL BLANK 6/23 60 MKg)					•
8706 024 ** 0001BL BLANK 00010 BH048719BR MS 22 JB 650 B 0010 BH048719BR MS 22 JB 1100 B 0010 BH048719BR MS 23 JB 1100 B 0020 BH048710VT 17 JB 350 B 0030 BH048710VT 16 JB 490 B 8706 042 ** 8706 042 ** 8706 042 ** 8706 058 BH298717WT 10 J 430 B 0060 BH298717WT 10 J 430 B 0070 BH298713CT 11 J 430 B 8706 058 ** 8706 058 ** 8706 058 ** 8706 058 ** 8706 058 ** 8706 069 069 069 069 069 069 069 069 069 0				750	-
0001BL BH048719BR 22 JB 650 B 0010MS BH048715CT 11 JB 350 B 0020 BH048715CT 11 JB 350 B 0030 BH048715CT 11 JB 350 B 0040 BH048710MT 16 JB 490 B 8706 042 ** 0001BL 0616 BLANK 0010 BH29870010 BH298717WT 10 J 430 B 0070 BH298717WT 10 J 430 B 8706 058 ** 0001BL BLANK 6/23 - 40 J	8706 024	*			
00100 BH048719BR S 22 JB 650 B 1100 B 00100MS BH048719BR MS 23 JB 1100 B 350 B 1100 B 0020 BH04870010 IT JB 200 B 17 JB 200 B	8706-024 0001BL	BLANK			
0010MS BH048719BR MS 23 JB 1100 B 0020 BH048719CT 11 JB 350 B 0030 BH048710WT 16 JB 200 B 8706 042 ** 8706 042 ** 0001BL 0616 BLANK 0616 BLANK 0616 BL298710WT 10 J 53 B 0050 BH298710WT 10 J 53 B 0060 BH298711WT 10 J 430 B 0070 BH2987116BR 10 J 430 B 8706 058 ** 0001BL BLANK 6/23 40 J Estimated concentration below detection limit B Not detected (detection limit of 50 ug/kg)	8706-024-0010			650	-
## BHO48713CT	8706-024-0010MS			100	. 23
### 8706 042 ** ### 8706 042 ** ### 8706 042 ** ### 9 J	024	BH048715CT			
8706 042 ** 0001BL 0616 BLANK 0050 BH29870010 10 J 430 0070 BH298717WT 10 J 1770 0080 BH298713CT 11 J 430 8706 058 ** 0001BL BLANK 6/23 - 40 Estimated concentration below detection limit B Present in laboratory blank Not detected (detection limit of 50 ug/kg)		BH048710WT			-
0001BL 0616 BLANK 0050 BH29870010 10 J 0060 BH298717WT 10 J 0070 BH298716BR 10 J 0080 BH298713CT 11 J 8706 058 ** 0001BL BLANK 6/23 - 40 B Fresent in laboratory blank Not detected (detection limit of 50 ug/kg)	Batch 8706 042	*			
0050 BH298717WT 10 J 430 0060 BH298717WT 10 J 430 0070 BH298713CT 11 J 430 0080 BH298713CT 11 J 430 8706 058 ** 0001BL BLANK 6/23 - 40 B Fresent in laboratory blank Not detection limit of 50 ug/kg)	0706-042 0001BI				
0060 BH298717WT 10 J 430 0070 BH298713CT 10 J 170 0080 BH298713CT 11 J 430 8706 058 ** 0001BL BLANK 6/23 - 40 B Fresent in laboratory blank Not detected (detection limit of 50 ug/kg)	8706-042 0050 8706-042 0050	0010 BLANK BH29870010			
0000 BH298713CT 10 J 170 0080 BH298713CT 11 J 430 8706 058 ** 0001BL BLANK 6/23 - 40 B Fresent in laboratory blank Not detection limit by Present in laboratory blank Not detection limit of 50 ug/kg)	8706-042 0060	BH298717WT			
0080 BH298713CT 11 J 430 8706 058 ** 0001BL BLANK 6/23 - 40 Estimated concentration below detection limit Present in laboratory blank Not detected (detection limit of 50 ug/kg) Not detection limit of 50 ug/kg) Not detection limit of 50 ug/kg Not detection limit of 5	8706 042 0070	BH298716BR			
tch 8706 058 ** 058-0001BL BLANK 6/23 - 40 3 Estimated concentration below detection limit B Present in laboratory blank Not detected (detection limit of 50 ug/kg)	8706 042 0080	BH298713CT			
J Estimated concentration below detection limit B Present in laboratory blank Not detected (detection limit of 50 ug/kg)	Batch 8706 058 *	*			
J Estimated concentration below B Present in laboratory blank Not detected (detection limit	8706-058-0001BL	6/2	•		
J Estimated concentration below B Present in laboratory blank Not detected (detection limit					
Present in laboratory blank Not detected (detection limit of 50	r	oncentration			
Not detected (detection limit of 50	Pres	laboratory bl	9		
	Not Not	(detection	of 50		

B

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1 1

903 PAD MOUND AND EAST TRENCHES AREAS REMEDIAL INVESTIGATION REPORT ROCKY FLATS PLANT GOLDEN COLORADO DRAFT DECEMBER 31 1987

TABLE 4 2
VOLATILE ORGANICS IN SOILS
POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION
(ug/kg)

	10	rield Sample Number	er Methylene Chloride	vce come	ancanonia - 7
058	0010	BH30871020	13 J	220 B	33
0 840 9018	0200	BH 3087 LOWS	C 21		ST C
8706-058-0030	030	BH 308 / 20W I	~ 0	9 00 00 00 00 00 00 00 00 00 00 00 00 00	91
	0.70	NGC 7 1 80C NG))		•
** Batch	8706-062 **				
8706 069 0	181000	BLANK 6793	1	40 .1	
062	000122		1. 01	F 08	
8706-062	040	H25870			
8706-062-0040MS	040MS	BH25870009D MS			•
8706-062-0	040MSD	BH25870009D MSD	ı		•
8706-062-0050	050	BH258718BR		760 B	•
8706-062-0060	090	BH25870910	9 JB	70 B	Q
** Batch	8706-065 **				
8706-065 0	0001BL	BLANK 6/25	1	8 09	
	0002BL	LANK1			
065	0020	BH258709WT		340	16
8706-065 0	0900	BH258720WS	59 J		150
065	0070	BH25870009	L 8 I	110 B	0.00
8706-065-0	080	BHZ58716CT		1100 B	210
** Batch	8707-042 **				
	0001BL	BLANK		06	
8707 042 0	0040	BH23870008D	5 J		
8707-042 0	0020	BH238708CT			58
8707-042 0	0060	BH23870008	ω w 	110 B	
0 101 042 0		NG111067UG			
** Batch	8707 043 **				
	0001BL	BLANK		06	
043	0010	BH27870010	7 J		1
043	0020	BH278710CT	5 J	140 B	
-043	0030	BH278713BR			
** Batch	8707 045 **				
8707 045 0	0001BL	BLANK		06	
Notes J	- Estimated	ed concentration below	below detection limit		
1 Z	ا •	ted (detection	limit of 50 ug/kg)		
:					

903 PAD MOUND AND EAST TRENCHES AREAS REMEDIAL INVESTIGATION REPORT ROCKY FLATS PLANT GOLDEN COLORADO DRAFT DECEMBER 31 1987

TABLE 4 2
VOLATILE ORGANICS IN SOILS
POSSIBLY ATTRIBUTABLE FO LABORATORY CONTAMINATION

** Batch 8707 046 ** BA248708BR 7 J J 85 B 8707 046 00010BL 8707 047 047 047 047 047 047 047 047 047	045-0030 BH248708BR 045 0040 BH248705CT atch 8707 046 ** 046-0001BL O7/17 BLANK 046 0040 BH22871008 046 0040 BH22871018 046 0060 BH22870009 047 0060 BH22870009 047 0060 BH2887009T atch 8707 059 ** atch 8707 060 ** atch 8707 060 ** atch 8707 060 ** 060 0001BL BH288709BR 059 0030 BH288709BR 069 0040 BH288709BR 069 0040 BH288709BR 060 0001BL BH288709BR 060 0001BL BH288700WT 060 0001BL BH288700WT 061 0001BL BH38870010 061 0001BL BH38870010 061 0001BL BH388710WS 061 00000 BH388710WS 061 0060 BH388710WS		· · · · · ·	
tch 8707 046 ** 046 -0001BL 046 0040 046 0040 046 0040 047 0060 047 0060 048 0050 049 0050 049 0050 049 0050 049 0050 049 0050 049 0050 049 0050 049 0050 049 0050 049 0050 049 0050 049 0050 040 001BL 059 0060 069 0060 069 069 0	tch 8707 046 ** 046-0001BL BH228710WS 046 00400 BH22871009 046-0050 BH22871018 046-0050 BH22870009 046 0060 BH22870009 047 0060 BH2887009BR 059 0030 BH288709BR 059 0040 BH288709BR 059 0040 BH288705WZ 060 0040 BH288705WZ 061 00060 BH388710WS 061 0060 BH388710WS 061 0060 BH388710WS			
046-0001BL 07/17 BLANK 046-0000BL BH22871008	046-0001BL BH228710WS BH228710WS BH228710WS BH22871018 BH22870009 BH22871018 BH22871018 BH22870009 BH22870009 BH22870009 BH22870009 BH22870009 BH22870009 BH22870009 BH22870009 BH228720CT BH27 0060 BH2887009 BH288700WT BH288700CT Cth 8707-061 ** CC 0001BL BLANK BH288705WS BH288706CT Cth 8707-061 ** CC 0001BL BH288705WS BH288706CT Cth 8707-061 ** CC 0001BL BH288705WS BH28870010 BH28870010 BH388710WS BH388710WS BH388710WS BH388720BR			
446 0040 448 00400 449 00400 440 00400 449 00400 449 00400 449 00400 449 00400 449 00400 449 004	046 0040 046 0040MS 046 0040MS 046 0040MS 046 00600 047 0060 047 0040 047 0040 047 0060 047 0060 047 0060 047 0060 048 0080 059 0030 059 0030 059 0030 059 0040 059 0040 059 0050 059 0040 059 0050 059 0040 059 0050 059 0060 060 0001BL			
046 0040MS BH22870009 MS	046 0040MS BH22870009 046-0050 BH22871018 046 0060 BH22871018 047 0060 BH22870009D 047 0040 BH22870009D 047 0060 BH228720CT 047 0060 BH228720CT 048 0030 BH228700WT 059 0030 BH288709BR 059 0040 BH288709WT 050 0040 BH288700WT 050 0040 BH288705WS 060 0040 BH288705WS 061 0001BL BH288705WS 061 0001BL BH288705WS 061 00000000000000000000000000000000000			
tch 8707 047 ** BH22871018 - 600 tch 8707 047 ** BH22871009 - 650 tch 8707 047 ** BH228720CT	046-0050 046 0060 tch 8707 047 ** 047 0001BL 047 0040 047 0060 tch 8707 059 ** 059 0030 059 0030 059 0040 059 0050 tch 8707 060 ** tch 8707 061 ** tch 8707-061 ** 060 0001BL 060 0001BL 060 0000000000000000000000000000000000			
tch 8707 047 ** 047 0001BL	tch 8707 047 ** 047 0001BL 047 0040 047 0060 tch 8707 059 ** 059 0030 059 0040 059 0040 059 0040 tch 8707 060 ** tch 8707 061 ** tch 8707-061 ** 061 0001BL 061 0001BL 060 0040 060 0040 060 0040 060 0050			
047 0001BL	047 0001BL 047 0040 047-0050 047 0060 tch 8707 059 ** 059-0001BL 059 0040 059 0050 tch 8707 060 ** tch 8707-061 ** tch 8707-061 **			
047 0000 BH22870009B - 650 047 0000 BH228720CT B J J 738	047 0040 047 0060 047 0060 047 0060 059 0060 059 0030 059 0040 059 0050 1ch 8707 060 ** 060 0001BL 060 0040 060 0040 060 0040 060 0040 060 0050 060 0050 061 0001BL			
tch 8707 059 ** tch 8707 059 ** tch 8707 059 ** tch 8707 059 ** bild 28722BR color of the state of concentration below detection limit bild 28722BR color of the state of concentration limit of 50 ug/kg) tch 8707 073 0001BL bild 28722BR color of the state of concentration limit of 50 ug/kg) color of the state of concentration limit of 50 ug/kg) color of the state of concentration limit of 50 ug/kg) color of the state of concentration limit of 50 ug/kg)	047-0050 047 0060 tch 8707 059 ** 059-0001BL 059 0030 059 0040 059 0050 tch 8707 060 ** tch 8707-061 ** tch 8707-061 ** 061 0001BL 061 0001BL 061 0001BL			
tch 8707 059 ** tch 8707 059 ** tch 8707 059 ** tch 8707 059 ** 659-0001BL BH288709BR 659 0030 BH28870104 BH28870104 CH CH CH CH CH CH CH CH CH C	tch 8707 059 ** tch 8707 059 ** 059-0001BL 059 0030 059 0050 tch 8707 060 ** 060 0001BL 060 0040 tch 8707-061 ** 061 0001BL 061 0001BL			
tch 8707 059 ** tch 8707 059 ** 059-0001BL BH288709BR 059 0030 BH288700WT Color BH288700WT Color Color BH288700WT Color Color BH288700WS Color Color BH288705WS Color Color BH288705WS Color Color BH288705WS Color Color BH388705WS Color Color BH388700HO Color Color BH388720BR Colo	tch 8707 059 ** 059-0001BL 059 0030 059 0040 059 0050 tch 8707 060 ** 060 0001BL 060 0040 060 0040 tch 8707-061 ** 061 0001BL 061 0000	ı		
059 -0001BL BLANK 7/18 059 0030 BH288700WT 059 0040 BH28870104 tch 8707 060 ** tch 8707 -061 ** 660 0001BL BLANK 061 0001BL BLANK 062 0040 BH288705WS 12 J 58 063 0040 BH38870010 tch 8707-061 ** tch 8707-061 ** 12 J 58 064 0060 BH38870010 065 0060 BH388720BR 12 J 58 065 0060 BH38870010 BH38	059-0001BL 059 0030 059 0040 059 0050 1ch 8707 060 ** 060 0001BL 060 0050 1ch 8707-061 ** 061 0001BL 061 0001BL	I		
059 0030 BH288709BR	059 0030 059 0040 059 0050 tch 8707 060 ** 060 0001BL 060 0040 060 0050 tch 8707-061 ** 061 0001BL 061 0001BL	ı		
tch 8707 060 ** 1ch 8707-061 ** 1ch 8707-061 ** 1ch 8707-073 ** 1ch 87	059 0040 059 0050 tch 8707 060 ** 060 0001BL 060 0050 tch 8707-061 ** 061 0001BL 061 0000	ı	•	
atch 8707 060 ** 060 0001BL BLANK -060 0040 BH288705WS 12 J 58 061 0001BL BH288706CT 12 J 70 atch 8707-061 ** 061 00001BL BLANK -061 0040 BH38870010 -061 0050 BH38870BR 12 J 87 atch 8707-073 ** -073 0001BL BLANK S J = Estimated concentration below detection limit B Present in laboratory blank Not detected (detection limit of 50 ug/kg)	atch 8707 060 ** 060 0001BL -060 0040 060 0050 atch 8707-061 ** 061 0001BL -061 0060		1	
060 0001BL BLANK -060 0040 BH288705WS 12 J 58 060 0040 BH288706CT 12 J 70 atch 8707-061 ** 061 0001BL BLANK -061 0040 BH38870010 12 J 86 -061 0040 BH388720BR 12 J 86 atch 8707-073 ** -073 0001BL BLANK 5 J 15 Not detected (detection limit of 50 ug/kg)	060 0001BL 060 0040 060 0050 atch 8707-061 ** 061 0001BL -061 0050 -061 0060			
060 0001BL BLANK -060 0040 BH288705WS 12 J 58 060 0050 BH288706CT 12 J 70 atch 8707-061 ** 061 0001BL BLANK -061 0060 BH38870010 -061 0060 BH388720BR 112 J 86 atch 8707-073 ** atch 8707-073 ** atch 8707-073 ** -073 0001BL BLANK -073 0001BL BLANK S J = Estimated concentration below detection limit B Present in laboratory blank Not detected (detection limit of 50 ug/kg)	060 0001BL -060 0040 060 0050 atch 8707-061 ** 061 0001BL -061 0050 061 0060			
060 0040 BH288705WS 12 J 58 060 0050 BH288706CT 12 J 70 atch 8707-061 ** 061 0001BL BLANK -061 0040 BH38870010 12 J 86 -061 0050 BH388710WS 12 J 86 atch 8707-073 ** -073 0001BL BLANK S J = Estimated concentration below detection limit B Present in laboratory blank B Present in laboratory blank B Present in laboratory blank Not detected (detection limit of 50 ug/kg)	-060 0040 060 0050 atch 8707-061 ** 061 0001BL -061 0050 061 0060			
atch 8707-061 ** 061 0001BL BLANK -061 0040 BH38870010 -061 0050 BH388710WS 12 J 86 atch 8707-073 ** -073 0001BL BLANK S J = Estimated concentration below detection limit B Present in laboratory blank Not detected (detection limit of 50 ug/kg)	atch 8707-061 ** 061 0001BL -061 0040 -061 0050 061 0060			
0001BL BLANK 00040 BH38870010 12 J 86 0050 BH388710WS 12 J 12 J 0060 BH388720BR 12 J 87 8707-073 ** 0001BL BLANK J = Estimated concentration below detection limit B Present in laboratory blank Not detected (detection limit of 50 ug/kg)	0001BL 0040 0050 0060			
Descript	0040 0050 0060			
### 12.0 #### 12.0 #### 12.0 #### 12.0 #### 12.0 #### 12.0 #### 12.0 ##### 12.0 ###################################	0050 0060	1 6		
tch 8707-073 ** tch 8707-073 ** 073 0001BL BLANK 5 J 15 J = Estimated concentration below detection limit B Present in laboratory blank - Not detected (detection limit of 50 ug/kg)	061 0060	12 5		
tch 8707-073 ** 073 0001BL BLANK 5 J 15 J = Estimated concentration below detection limit B Present in laboratory blank Not detected (detection limit of 50 ug/kg)				
073 0001BL BLANK 5 J 15 J = Estimated concentration below detection limit B Present in laboratory blank - Not detected (detection limit of 50 ug/kg)	8707-073			
<pre>J = Estimated concentration below B Present in laboratory blank - Not detected (detection limit</pre>	0001BL			
J = Estimated concentration below B Present in laboratory blank - Not detected (detection limit				
- Not detected (detection limit of 50	J = Estimated B Present 11			
	- Not detected	of 50		

(1) 6 /Kg)

		(ug/kg)		
RFW Batch ID	Field Sample Number	Methylene Chloride	Acetone	2 Butanone
8707 073 0030 8707 073 0040 8707-073-0040MS	BH378705WS BH268706BR BH268706BR MS	12 J 8 J 10 J	99 120	'
** Batch 8707-079 **				
8,07 079 0001BL 8707 079 0040 8707-079 0050 8707 079-0060	BI ANK BH37871113 BH378725BR BH378721CT	5 J 17 JB 17 JB 12 JB	15 J 48 JB 150 B 130 B	·
** Batch 8707-082 **				
-085	BLANK		15 J	• •
785 -085 -087	BH36870005	n - c	19 J	•
8707 082 0090 8707 082 0110 8707 082 0120	БН 368705D ВН 36870515 ВН 368723BR		51 64	
** Batch 8707 103 **				
8707-103-0001BL 8707 103 0030 8707 103 0040	BLANK BH35870012 BH35870012D		170 310 360	
** Batch 8707 106 **				
8707 106-0001BL 8707 106 0040 8707 106-0050 8707 106 0060	BLANK BH358715CT BH358718BR BH35871215	1 1	170 480 280	
** Batch 8707 110 **				
8707-110 0001BL 8707 110-0002BL 8707 110 0080 8707-110 0090 8707-110 0100	BLANK 8/7 BLANK 8/8 BH348718CT BH348721BR BH348715WS	1 1 1 1	170 105 210 130 150	

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903 PAD MOUND AND EAST TRENCHES AREAS REMEDIAL INVESTIGATION REPORT ROCKY FLATS PLANT GOLDEN COLORADO DRAFT DECEMBER 31 1987

Estimated concentration below detection limit Present in laboratory blank Not detected (detection limit of 50 ug/kg) Not analyzed Not spiked

F 1

n B

Notes

NA NS -

TABLE 4 2
VOLATILE ORGANICS IN SOILS
POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINAFION
(ug/kg)

RFW Batch ID	Field Sample Number	Methylene Chloride	Acetone	2 Butanone
8707 110 0110 8707 110-0120 8707 110 0130 8707 110 0140 8707 110-0140MS	BH348708CL BH34870008 BH34870815 BH3487815D	ı	350 210 500 -	1 1 1
** Batch 8708-002 **	*			
8708-002 0001BL 8708 002 0070 8708 002 0080 8708-002-0090 8708-002-0100 8708-002 0110	BLANK BH338720WT BH338716CT BH33870004 BH33870815 BH3387815D	. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	70 96 170 320 130 160	1 1 1
** Batch 8708 010 **	*			
0001BL 0060 -0070 -0080 0090	BLANK BH328716CT BH328718BR BH32870008 BH32870018	ו מטט טטט	35 J 86 170 99 120 91	ı ı
** Batch 8708 012 *	**			
8708 012-0001BL 8708 012-0050 8708 012-0060 8708 012-0070 8708 012-0080	BLANK BH31870013 BH31870013D BH318713CT BH318716BR	17 J 10 J 15 J 9 J	70 89 70 100 110	F 1 1 1 1
** Batch 8708 030 **	*			
8708 030-0001BL 8708-030 0002BL 8708 030-0130 8708 030 0140 8708 030 0150	BLANK 8/17 BLANK 8/18 BH398700FS BH398702DH BH398704DH	1 11	75 90 110 79 170	4 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
Notes J - Estimate B Present - Not det. NA Not ana NS Not spi	Estimated concentration below detection limit Present in laboratory blank Not detected (detection limit of 50 ug/kg) Not analyzed	detection limit of 50 ug/kg)		

TABLE 4-2	VOLATILE ORGANICS IN SOILS	POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION	(ug/kg)
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08 030-0160 BH3987 08 030 0170 BH3987 08 030 0170MS BH3987 08 030 0180 BH3987 08 030 0190 BH3987 08 030-0200 BH3987 08 030 0220 BH4087 08 030 0220 BH4087 08 030-0240 BH4087 08 030-0240 BH4187 08 041-0001BL BH4187 08 041-0000 BH4187 08 044 00001BL BH4187 08 044 00000 BH4187 08 044 00000 BH4287	, , , , , , , , , , , , , , , , , , , ,	200 150 180 NS 170 120 140 150 150 210 150	14 0 4 6 7 6 6 8 8 6 5 6 8 8 8 6 5 6 8 8 8 8 9 1 1 1 1 1 1 1 1
030 0170MS BH398712UC 030 0170MS BH398712UC 030 0180 BH398712UC 030 0180 BH398717BR 030-0200 BH398707DH 030 0220 BH408707UC 030 0220 BH408707UC 030 0220 BH408707UC 030-0240 BH408707UC 031-0041-0060 BH418712UC 041-0060 BH418712UC 041-0090 BH418712UC 041-0090 BH418717BR 044 00040 BH428717WT 044-0050 BH42870709	1 1 1 1 1 1 1		∞ ಎಎ →
030 0170MS BH398712UC 030 0180 BH398712UC 030 0190 BH398714CT 030-0200 BH398707BH 030 0220 BH408707DH 030 0220 BH408707DH 030 0220 BH408707DH 030-0240 BH408707C1 030-0240 BH41870912 041-0000 BH418712UC 041 0080 BH418712UC 041 0080 BH418712UC 041 0080 BH418712UC 041 0080 BH418717UC 041 0000 BH418717UC 044 00001BL BH428717WT 044 00001BL BH428717WT 044 00000 BH428717WT	1 1 1 1 1		٠
030 0180 030 0180 030 0190 030 0190 030 0200 030 0220 030 0220 030 0220 030 0230 030-0240 030-0240 031-020 041-0200		170 120 120 120 120 150 210 150 150	ic is is a so is
030 0190 BH3987 030-0200 BH3987 030 0220 BH3987 030 0220 BH4087 030-0240 BH4087 030-0240 BH4087 041-0001BL BH4187 041-0060 BH4187 041-0090 BH4187 041-0090 BH4187 041-0090 BH4187 041-0090 BH4187 041-0090 BH4187 041-0090 BH4187	1 1 1 1 1	120 220 220 120 150 210 210 150	ம் ம் ∞்
030-0200 BH3987 030 0210 BH3987 030 0220 BH4087 030-0240 BH4087 030-0240 BH4087 041-0001BL BLANK 041-0060 BH4187 041-0090 BH4187 041-0090 BH4187 041-0090 BH4187 atch 8708 044 **	11 11	140 220 120 150 20 210 150	ũn co
030 0210 BH3987 030 0220 BH4087 030 0230 BH4087 030-0240 BH4087 041-0001BL BH4187 041-0060 BH4187 041-0090 BH4187 041-0090 BH4187 041-0090 BH4287 044-0050 BH4287	1 1 1 1 1	220 140 150 150 210 150 150	ω
030 0220 BH4087 030 0230 BH4087 030-0240 BH4087 atch 8708 041 ** 041-0000 BH4187 041-0070 BH4187 041-0090 BH4187 041-0090 BH4187 atch 8708 044 ** 044 0040 BH4287 044-0050 BH4287	1 1 1 1	140 120 150 210 210 210 150	
030-0230 BH4087 030-0240 BH4087 atch 8708 041 ** 041-0001BL BH4187 041-0070 BH4187 041-0090 BH4187 atch 8708 044 ** 044 0000BL BH4287 044-0050 BH4287 atch 8708 047 **	1 1 1 1	120 150 210 150 150	
atch 8708 041 ** -041-0001BL BH4187 041-0060 BH4187 041-0090 BH4187 atch 8708 044 ** 044 00001BL BH4287 044-0050 BH4287		90 210 150 210 150	
atch 8708 041 ** -041-0001BL BH4187 041-0060 BH4187 041-0090 BH4187 041-0090 BH4187 atch 8708 044 ** 044 0040 BH4287 atch 8708 047 **	1 1 1 1	90 210 150 210 150	
041-0001BL BLANK 041-0060 BH4187 041-0070 BH4187 041-0090 BH4187 atch 8708 044 ** 044 0001BL BLANK 044 0040 BH4287 atch 8708 047 **	1 1 1 1	90 210 150 210 150	
041-0001BL BLANK 041-0060 BH4187 041-0070 BH4187 041-0090 BH4187 041-0090 BH4187 044-0090 BH4287 044-0050 BH4287	1 1 1 1	210 150 210 150	
041-0000 BH4187 041-0070 BH4187 041-0090 BH4187 041-0090 BH4187 044 0001BL BLANK 044 0040 BH4287 044-0050 BH4287	1 11	210 150 210 150	
041 0080 BH4187 041-0090 BH4187 041-0090 BH4187 044 0001BL BLANK 044 0040 BH4287 044-0050 BH4287	1 1	150 150	
041-0090 BH4187 atch 8708 044 ** 044-0050 BH4287 044-0050 BH4287 atch 8708 047 **	1 1	210 150	
atch 8708 044 ** 044 0001BL BLANK 044 0040 044-0050 BH4287 atch 8708 047 **			
atch 8708 044 ** 044 0001BL BLANK 044 0040 044-0050 BH4287 atch 8708 047 **			
044 0001BL BLANK 044 0040 BH4287 044-0050 BH4287 atch 8708 047 **			
044 0040 BH4287 044-0050 BH4287 atch 8708 047 **		i c	
044-0050 BH4287	1 1	7.1	
Batch 8708 047 **		100	
Batch 8708 047 **			
047-0001BL BLANK	ı	195	
08 047 0002BL	1	135	
047 0070 BH4287	1	140	
047-0080	•		
047 0090		140	
047 0100	1	89	
047-0110	1	62	
-047-0120	ı	110	
047-0120MS BH4	1	110 NS	
8708-047-0140 BH428722CT	ı	ı	
** Batch 8708-049 **			
8708-049-0001BI. BI.ANK	ı	100	
	i	671	
Estimate	elow detection limit		
11 11	nk imit of 50 ug/kg)		
analyzed			

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(D = / D =)

RFW Batch ID	Field Sample Number	Methylene Chloride	Acetone	2 Butanone
8708 049 0020	BH428739FS		120	
** Batch 8708 053 **				
8708 053-0001BL 8708-053 0020	BLANK BH428745DH	1	35 J 78	ı
** Batch 8709 002 **				
8709-002 0001BL 8709-002 0030 8709-002 0040	BLANK BH45870709 BH45871417	† 1 i		1
** Batch 8709-007 **				
8709 007 0001BL 8709-007 0070 8709 007 0080 8709-007 0090 8709-007 0100 8709-007 0110	BLANK BH458717UC BH458720CT BH458722BR BH458725FS BH458730DH	1 1 1 1		
** Batch 8709 011 **				
8709-011 0001BL 8709-011 0030 8709-011-0040	BLANA BH458732FS BH458735FS	ı		1
** Batch 8709 018 **				
8709 018 0001BL 8709-018 0030 8709-018 0040	BLANK BH46870709 BH46871719	•	111	1 1
** Batch 8709 023 **				
8709-023 0001BL 8709-023 0030 8709 023-0040	BLANK BH468724UC BH468726CT	טז ן כו	160 210 B 170 B	1 1
Notes J Estimat B Present Not det	Estimated concentration below detection limit Present in laboratory blank Not detected (detection limit of 50 ug/kg)	w detection limit t of 50 ug/kg)		

N S

TABLE 4 2 VOLATILE ORGANICS IN SOILS POSSIBLY ATFRIBUTABLE TO LABORAFORY CONTAMINATION	(119/10)
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	VOL POSSIBLY ATFRIB	TABLE 4 2 VOLATILE ORGANICS IN SOILS POSSIBLY ATFRIBUTABLE TO LABORAFORY CONTAMINATION (ug/kg)	NTAMINATION	
RFW Batch 1D	F eld Sample Number	Methylene Chloride	Acetone	2 Butanone
8709 023 0050 8709 023 0050MS	BH468729BR BH468729BR MS	. 6 . 5	270 B 260 BNS	
** Batcl 8709 027 **				
8709-027 0001BL	BLANK	ŧ	160	
-027	BH438700FS	R J	340	150
8709 027-0090	BH438702FS	12 J	240	100
027	BH438707DH	æ c	0000	120
027	ВН438712DH	14 5	300	130
027	ВН438714DH	15 J	290	110
027	BH438717DH	13 J	360	130
8709-027 0150 8709-027 0160	BH438709DH BH4387407D	13. J	290	110
** Bot 0700 034 +*		3) - 	
Datem order 034				
034	BLANK 9/18		135	
8709-034 0050 0700 034 0050 MS				
034-	BH438122DH MS BH43879511C	130 NS		
034	BH438727CT	16 JB	120 B	
	BH438730BR		150 B	i
** Batch 8709-038 **				
	İ			
8709-038 0001BL	BLANK		06	
8708 038-038	BH448704DH			
0 00	B8448714DH BU448719DU	r •		1
	BH448713DH			•
	BH448724DH	3 C C C C C C C C C C C C C C C C C C C	140 B	•
038	BH448729WF			, ,
8709 038 0140	BH448732BR	25 J		ı
** Batch 8709 043 **				
04	BLANK		100	•
6	ВН568702DH		001	04

= Estimated concentration below detection limit
Present in laboratory blank
= Not detected (detection limit of 50 ug/kg)
- Not analyzed
Not spiked

Notes

TABLE 4 2	VOLATILE ORGANICS IN SOILS	POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION	(11)1:
		POSSIBLY	

0.43 0.000 0.45 0.000 0.4	RFW Batch ID	Field Sample Number	Methylene Chloride	Acetone	2 Butenon
141 000 000 000 000 000 000 000 000 000					
142 000 BH 568712H MS	043	DU669704BC			
tich 8709-052 ** tich 8709-052 ** 112 8709-052 ** 112 8709-052 ** 113 8478725H 114 8709-052 ** 115 84487725H 115 95 84 115 95 84 115 95 84 115 95 84 115 95 84 115 95 84 115 95 84 115 95 84 115 95 84 115 95 84 115 95 84 115 95 84 115 95 84 115 95 84 115 95 84 115 95 84 115 95 84 115 95 84 115 8709 961 ** 115 8709 061 ** 115 8709 061 ** 115 8709 061 ** 115 8709 061 ** 115 8709 061 ** 115 95 95 95 95 95 95 95 95 95 95 95 95 95	2 4 5	Buscalour		1	
1tc 8709-052 ** 1tc 8709-051 ** 1tc 8709-05	043	ВН5687120Н		ı ı	
125 00201BL BLANK 052 00010 BH4787045F 052 00040 BH4787045F 052 00040 BH4787045F 053 00040 BH4787045F 054 00040 BH4787045F 055 01040 BH4787045H 055 01040 BH5387045H 056 01040 BH478724T 010 JB 058 00001BL 058 00001BL 058 01040 BH4787224T 010 JB 058 01040 BH4787224T 010 JB 058 01040 BH5387144H 010 JB 058 01040 BH5387124H 010 JB 058 01060 058 0	043			ı	
062 0001BL BLANK 062 0040 BH47870EFS 7 J J 84 062 0040 BH47870EFS 120 062 0060 BH47870EFH 120 062 0100 BH47870EHH 120 062 0140 BH47870EHH 130 062 0140 BH47870EHH 130 062 0140 BH47870EHH - 6 J 130 062 0140 BH47871EHH - 6 J 130 062 0140 BH47871EHH - 6 J 130 062 0200 BH5870EHH - 5 J 188 062 0200 BH5870EHH - 5 J 188 062 0200 BH5870EHH - 6 J 130 062 0200 BH5871EFS 18 BH5872EHH - 10 JB 1600 063 0000BL BH47872EFF 18 JB 19 JB 2000 064 0000 BH5877EHH - 10 JB 1600 068 0100 BH58772EH - 9 JB 2000 069 0100 BH58772EH - 9 JB 2000 060 0100 BH5877EH - 9	Batcl 8709-052 *	*			
10 10 10 10 10 10 10 10	052	BLANK		195	
052 0040 BH478702FS - 65 052 0060 BH478704PH - 120 052 0100 BH478704PH - 120 052 0100 BH478704PH - 93 052 0140 BH478719DH - 93 052 0140 BH478719DH - 93 052 0140 BH478719DH - 93 052 0160 BH478719PH - 93 052 0170MS BH568702PH MS 21 JNS 120 052 0200 BH58702PH	052	BH478700FS		•	
052 0060 BH478705DH - 120 052 0120 BH478705DH - 120 052 0120 BH478705DH - 120 052 0120 BH478711DH - 11 J 70 052 0160 BH478711DH 6 J 1130 052 0160 BH58705DH 5 J 130 052 0170MS BH58705DH 5 J 130 052 0200 BH58705DH 6 J 1130 61 052 0200 BH58705DH 6 J 130 052 0200 BH58705DH 10 JB 820 058 0002BL BH478721FS 11 JB 820 058 00000BL BH58711DH 10 JB 160 058 0100 BH58712DH 10 JB 160 058 0100 BH58712DT 10 JB 100 058	052	BH478702FS			
Deciding color	052	ВН478704DH			
052 0100 BH47870BDH 93 052 0100 BH47870BDH 93 052 0140 BH47871DBH 93 052 0140 BH47871DBH 93 052 0140 BH47871DBH BH47871DBH BH47871DBH BH47871DBH BH57870BDH BH57872BR BH57870BDH BH57872BR BH57872BR BH57872BR BH57872BR BH57872BR BH57872BR BH57872BR BH57872BB BH578787B BH57872BB BH57872BB BH57872BB BH57872BB BH57872BB BH57872BB B	052	ВН478706DH	1		
052 0120 BH478709DH - 93	052	ВН478708DH			
052 0140 BH478711DH - 1 93 055 0170MS BH588721B MS 21 JNS 120 055 0170MS BH588722BR MS 21 JNS 120 120 055 0170MS BH588700DH MS 21 JNS 120 120 055 0200 BH588700DH	052	BH478709DH			
0.052 0170MS BH568722BR MS 21 JNS 120 0.052 0170MS BH568722BR MS 21 JNS 120 0.052 0200 BH538702BH MS 21 JNS 175 0.052 0200 BH538702BH B	052	BH478711DH	1		
10	052				
052 0180 BH538702DH 11 J 75 052 0200 BH538702DH - 5 J 61 052 0201 BH538702DH - 5 J 61 052 02020 BH538702DH - 5 J 61 052 02020 BH538706DH 6 J 130 052 02020 BH538706DH 6 J 130 052 02020 BH56872CT	052				
0.02 0.200 BH0.38702DH 5 J 61 0.02 0.200 BH7.38702DH - 5 J 61 0.05 0.201 BH7.38702DH - 5 J 53 0.05 0.202 BH5.38706DH 6 J 130 0.05 0.202 BH5.38706DH 6 J 130 0.05 0.203 BH5.8872DR 6 J 120 0.05 0.203 BH5.8872DR 20C 26 0.05 0.010L BH5.872DR 15 J 100 0.05 0.002BL BH7.8716FS 15 JB 820 0.05 0.002BL BH7.872DH 12 JB 820 0.05 0.002BL BH7.872DH 11 JB 820 0.05 0.002BL BH7.872DH 11 JB 900 0.05 0.002BL BH7.872DH 11 JB 820 0.05 0.000 BH7.872DH 10 JB 900 0.05 0.000 BH5.38710DH 10 JB 10 JB 2000 0.05 0.000 BH5.3872DR 9 JB 2000 0.000 BH5.	052	ВН5387000Н	11 J		
052-0210 BH378705DH - 53 062-0220 BH538706DH 6 J 58 062-0220 BH538706DH 6 J 5 J 74 062-0220 BH538706DH 6 J 130 062-0220 BH588708DH 6 J 130 062-0220 BH58872DT 48 120 062-0230 BH568722BR 26 110 062-0230 BH568722BR 26 110 068-001DL BH568722BR 110 JB 820 068-002BL BH478716FS 110 JB 820 068-0060 BH47872DH 110 JB 900 068-0140 BH538714DH 10 JB 10 JB 430 068-0140 BH538716DH 10 JB 10 JB 430 068-0150 BH538716DH 10 JB 10 JB 2000 068-0160 BH53872BR 9 JB 2000 068-0160 BH53872BR 9 JB 2000 068-0160 BH53872CBR 9 JB 2000	250	BH538702DH	ۍ ۲ د		
0.02 0.230 BH538706DH 6 J 130 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.	200	BH478715DH	ı		
052 0200 BH568720H	700	BH538706DH	,		
052 0270 BH568722BR 26 170	700	5H338708UH	י פ		
110 oct of the state of the state of the state of the state oct	0.00	Buscortwi	٦ ° ٠		
110 oct 2010	0 6 6 6	100710000	0 Y		
atch 8709 058 ** 058 0001BL BLANK 9/18 15 J 100 058 0002BL BLANK 9/19 15 J 100 058 0002BL BH478716FS 11 JB 820 058-0050 BH47872DH 12 JB 440 058-0070 BH47872LFS 15 JB 480 058-0140 BH538714DH 10 JB 430 058-0150 BH538719MT 10 JB 430 058-0160 BH53872CT 9 JB 2400 058 0170 BH53872CT 9 JB 2400 1cch 8709 061 ** BLANK 9/21 5 J 5 J 061 0001BL BLANK 9/21 5 J 95 10 DB Bresent in laboratory blank 10 mint 10 mint	700	NG77160611G	97		
058 0001BL BLANK 9/18 15 J 100 058 0002BL BLANK 9/19 15 J 100 -058-0050 BH478720F 11 JB 420 058-0060 BH478720F 15 JB 480 058-0070 BH47872FF 11 JB 480 058-0140 BH538714DH 10 JB 900 058-0150 BH538714DH 10 JB 430 058-0160 BH538716DH 10 JB 1600 058 0170 BH53872CT 9 JB 2400 1tch 8709 061 ** 1cch 8709 061 ** 5 J 5 J 1cch 8709 061 ** 5 J 95 1cch 8709 061 ** 5 J 95 1cch 8709 061 ** 5 J 95	Batch 8709 058 *	*			
058 0002BL BLANK 9/19 15 J 100 058-0050 BH478716FS 111 JB 820 058-0060 BH478721FS 115 JB 4410 058-0070 BH478722WT 111 JB 330 058-0140 BH538716DH 10 JB 900 058-0140 BH538716DH 10 JB 1600 058-0150 BH538720CT 9 JB 1600 058 0170 BH538722BR 9 JB 22000 058 0180 BH538722BR 9 JB 2400	058			06	
11 JB 820 98478716FS 11 JB 820 9820 9820 9820 9820 98478720DH 12 JB 12 JB 410 9820 9	058	BLANK 9/19	15 J	100	
058-0060 BH478720DH 12 JB 410 -058-0070 BH478721FS 15 JB 18 JB -058-0080 BH478722WT 11 JB 330 058-0140 BH538714DH 10 JB 900 058-0140 BH538716DH 10 JB 1600 058-0160 BH538720CT 9 JB 2000 058 0170 BH538722BR 9 JB 2000 058 0180 BH538722BR 9 JB 2400 058 180 BH538722BR 9 JB 2600		BH478716FS			
-058-0070 BH478721FS 15 JB 480 058-0080 BH478722WT 11 JB 330 058-0140 BH538714DH 10 JB 900 058-0140 BH538714DH 10 JB 430 058-0150 BH538719W1 10 JB 1600 058 0170 BH538722BR 9 JB 2400 1tch 8709 061 ** 8438722BR 5 J 5 J -061 0001BL BLANK 9/21 5 J 5 J 95 *** J - Estimated concentration below detection limit B Present in laboratory blank 5 J 95		BH478720DH			
058-0080 BH478722WT 11 JB 330 058-0140 BH538714DH 10 JB 900 058-0150 BH538716DH 10 JB 430 058-0160 BH538720CT 9 JB 2000 058 0170 BH538722BR 9 JB 2400 atch 8709 061 **	8709-058-0070	BH478721FS			
058-0140 BH538714DH 10 JB 900 058-0150 BH538716DH 10 JB 10 JB 430 -058-0160 BH538719W1 10 JB 1600 058 0170 BH538722BR 9 JB 2000 058 0180 BH538722BR 9 JB 2400 atch 8709 061 ** -061 0001BL BLANK 9/21 5 J 95 B Present in laboratory blank	8709 058-0080	BH478722WT			
058-0150 BH538716DH 10 JB 430 -058-0160 BH538719W1 10 JB 1600 058 0170 BH53872CT 9 JB 2000 058 0180 BH538722BR 9 JB 2400 atch 8709 061 ** -061 0001BL BLANK 9/21 5 J 95 S J - Estimated concentration below detection limit B Present in laboratory blank	8709 058-0140	BH538714DH			
-058-0160 BH538719W1 10 JB 1600 058 0170 BH53872CT 9 JB 2000 058 0170 BH538722BR 9 JB 2000 058 0180 BH538722BR 9 JB 2400 atch 8709 061 ** -061 0001BL BLANK 9/21 5 J 95 95 95 95 95 95 95 95 95		BH538716DH			
058 0170 BH538720CT 9 JB 2000 058 0180 BH538722BR 9 JB 2400 atch 8709 061 ** -061 0001BL BLANK 9/21 5 J 95 S J - Estimated concentration below detection limit B Present in laboratory blank		BH538719W1			
058 0180 BH538722BR 9 JB 2400 tch 8709 061 ** 061 0001BL BLANK 9/21 5 J 95 J - Estimated concentration below detection limit B Present in laboratory blank	058	BH538720CT			
tch 8709 061 ** 061 0001BL BLANK 9/21 5 J J - Estimated concentration below detection limit B Present in laboratory blank	709 058 018	BH538722BR			
061 0001BL BLANK 9/21 J - Estimated concentration below detection limit B Present in laboratory blank	Batch 8709 061 *	*			
J - Estimated concentration below B Present in laboratory blank		BLANK 9/21	5 J	95	
B Present in laboratory blank	J - Estin				
, ,					

91 1 11 11

NA = NS

	I.S	CONTAMINATION	
TABLE 4-2	VOLATILE ORGANICS IN SOILS	POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION	(11g/kg)

870J 061 0002BI	BLANK 9/21 1	5 J	170	
09 061	BH478726CT			
8703 061-0050	BH4787026D	8 JB	480 B	
061	BH478727BR	6 JB		
8709 061-0080	BH548702WT	7 JB	300 B	
	BH558702DH		810 B	
8709 061-0190	BH558710DH		540 B	
-061	BH558712WT			
061-	BH55871424		850	
061	BH558727UC			
	BH558729CT	8F 80	200	
061	BH558732BR			
06.1	BH558732BRD	ar. a		
061	ВН558734DH	8 JB	300 B	
** Batch 8709-064 **				
8709-064 000181.	BL.ANK 9/22	 .c	00 00	
7 9 0	·		•	
* 000			•	
-004	HU8948708DH			
8709 064 0070	BH548710DH	13 JB		
064-				
8709 064 0080MS	BH548712DH MS			
8709-064 0100	BH48870006	11 JB	100 B	
** Batch 8709 065 **				
8709 065 0001BL	BLANK	10 J	75	
-065-	BH48871011C			
0100 066-0060	DO 1 100 1 100 P 10 10 10 10 10 10 10 10 10 10 10 10 10	1	a 0000	
0000-100-0010	DOT 100 FING	ı		
0900 090-8078	10 10 10 10 10 10 10 10 10 10 10 10 10 1	1		
8709-065-0110	S4707808H9	•		
8709-065-0120	BH508712UC	•		
-01	BH508715CT	1		
8709-065 0140	BH508717BR	1	510 B	
** Batch 8709 069 **				
8709-069 0001BL	BLANK	10 J	75	
	BH49870008	i	300 B	

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1 1

903 PAD MOUND AND EAST TRENCHES AREAS REMEDIAL INVESTIGATION REPORT ROCKY FLATS PLANT GOLDEN COLORADO DRAFT DECEMBER 31 1987

Estimated concentration below detection limit Present in laboratory blank Not detected (detection limit of 50 ug/kg) Not analyzed Not spiked

1 1

NA I B S

Notes

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1 1 1

040 080 080 080 001 001 007 007 007 007 007 00	069-0040 BH49870816 - 10700 069-0060 BH54871424	069-0040 BH49870816 710 069-0060 BH51871424 1670 069-0060 BH51870009 BH51871424	069-0040 069 0060 069-0080 atch 8709 075 ** -075 00018L 075 0000 075 0080 075 0140 -075 0150 075 0160 075 0160 075 0160 075 0160 075 0160 075 0160 075 0160 075 0160 077 0160 077 0160 078 00018L		1 2 12649777 2	710 600 700 700 23 23 28 29 190 90 140	
15 0001BL BLANK BH448738WT 15 J 45 29 29 29 20 20 20 20 20 20 20 20 20 20 20 20 20	15 0001BL BLANK 10/29 075 ** 17 0001BL BH548738WT 29 29 29 20 20 20 20 20 20 20 20 20 20 20 20 20	15 0001BL BLANK	atch 8709 075 ** -075 0001BL 075 0060 075 0080 075 0080 075 0140 -075 0150 075 0160 075 0160 075 0160 075 0160 075 0160 077 0160 078 0001BL 078 0000		v 12649777 v		
075 0001BL BLANK 10/21	075 0001BL BLANK 075 00060 BH548738WT - 29 075 00060 BH548738WT - 29 075 00060 BH548742BR - 29 075 00090 BH548742BR 13 JB 460 075 0140 BH548720C 7 JB 190 075 0160 BH498720UC 7 JB 190 075 0160 BH498720UC 7 JB 140 075 0160 BH498724BR MS 7 JB 120 075 0160 BH498724BR MS 7 JB 120 075 0160 BH518712WT 6 JB 300 078 0040 BH518712WT 6 JB 42 078 0040 BH518712WT 6 JB 84 078 0040 BH528712WT 6 JB 84 078 0120 BH528712CT 6 JB 84 078 0140 BH52870CCT 6 JB 84 078 016 0050 BH52870CCT 6 JB 84 078 016 0050 BH52870CCT 6 JB 84 078 016 0050 BH52870CCT 10 JB 180 078 0050 BH52870CCT 10 JB 180 079 0050 BH52870CCT 10 JB 180 079 0050 BH52870CCT 10 JB 180 079 0050 BH	December BLANK 15 J 15 J 16 J 16 J 17 J 17 J 18	075 0001BL 075 0060 075 0060 075 0080 075 0090 075 0140 075 0160 075 0160 075 0160 075 0160 078 0001BL 078 0000 078 0000 078 0000 078 0000		n 10040rr 0		
075 0060 BH548738WT - 29 075 0070 BH548742BMT - 22 075 0080 BH548742BM	075 0060 BH548738WT - 29 075 0070 BH548740CT - 22 075 0080 BH548740CT - 15 JB 460 075 0080 BH548740CT - 13 JB 460 075 0080 BH548720C	075 0060 BH548738WT - 29 075 0070 BH548740CT - 22 075 0080 BH548740CT - 15 JB 460 075 0080 BH548740CT 13 JB 1280 075 0140 BH548720C 14 JB 1280 075 0140 BH548720C 7 JB 1280 075 0150 BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH518712WT 6 JB 420 078 0040 BH518712WT 6 JB 420 078 0040 BH518712WT 6 JB 420 078 0040 BH518717BR 6 JB 420 078 0100 BH52870010 6 JB 420 078 0100 BH52870010 6 JB 430 078 0100 BH52870010 6 JB 440 078 01000 BH52870010 6 JB 440 078 01000	075 0060 075 0070 075 0080 075 0090 075 0100 075 0140 075 0160 075 0160MS atch 8709-078 ** 078 0001BL 078 0001BL 078 0050 078-0060		12849777 2		
075 0070 BH548740CT - 22 075 0080 BH548740CT - 15 JB 460 075 0090 BH5487234 13 JB 580 075 0100 BH5487234 14 JB 13 JB 280 075 01400 BH548724DK 15 JB 190 075 01600 BH498724DK 15 JB 190 075 01600 BH498724DK 15 JB 140 075 01600 BH498724DK 15 JB 140 075 01600 BH518712BK 15 G JB 420 078 0040 BH518717BK 6 JB 300 078 0040 BH518717BK 6 JB 300 078 0050 BH518717BK 6 JB 300 078 0050 BH518717BK 6 JB 300 078 0120 BH52872CT 6 JB 51 078 0140 BH52872CT 6 JB 51 078 0150 BH52872CT 6 JB 51 078 0160 BH52872CT 6 JB 51 078 0160 0160 BH	075 0070 BH548740CT - 22 075 0080 BH548740CT - 460 075 0080 BH5487042B	075 0070 BH548740CT - 22 075 0080 BH548740CT - 456 075 0080 BH548702BR 15 JB 460 075 0100 BH54870334 14 JB 199 075 0100 BH54870334 14 JB 190 075 0160 BH548702CT 6 JB 91 075 0160 BH49872CT 7 JB 1120 078 0010 BH498724BR MS 7 JB 1120 078 0010 BH518713CT 6 JB 300 078 0010 BH518713CT 6 JB 300 078 0010 BH52870CT 6 JB 840 078 0100 BH52870CT 6 JB 940 078 0100 BH52870CT 7 JB 840 078 0100 BH52870CT 7 JB 940 078 0100 BH52870CT 7	075 0070 075 0080 075 0090 075-0100 075 0140 075 0160 075 0160MS atch 8709-078 ** 078 0001BL 078 0001BL 078 0050 078-0060		1 2 2 4 9 7 7 7 9		
075 0080 BH648742BR 15 JB 460 0075 0080 BH648742BR 13 JB 13 JB 190 0075 0080 BH648742BR 13 JB 191 JB 190 0075 0140 BH648720UC 6 JB 19 190 0075 0160 BH48872CHC 7 JB 190 0075 0160 BH48872CHR 7 JB 140 120 0075 0160NS BH498724BR MS 7 JB 140 140 BH548712WT 6 JB 180 0078 0040 BH548712WT 6 JB 180 0078 0040 BH548712WT 6 JB 190 0078 0120 BH548712WT 6 JB 190 0078 0140 BH548712DH 6 JB 190 0078 0140 BH528712DH 6 JB 190 0078 0140 BH528724BR 115 JB 180 0078 0160 BH588704C 6 JB 15 JB 180 0078 0160 BH588704C 6 JB 15 JB 180 0016 BH588704C 6 JB 180 0016 BH588704C 6 JB 100 JB 100 0016 BH588704C 6 JB 100 JB 100 0016 BH588704C 6 JB 100 JB 100 JB 100 0016 BH588704C 6 JB 100 JB 100 JB 100 0016 BH588704C 6 JB 100 JB 1	075 00800 BH548742BR 15 JB 460 075 0080 075 00800 BH548742BR 15 JB 19 0075 0080	075 0080 BH548742BR 15 JB 468 0075 0080 BH548742BR 15 JB 280 0075 0080 BH548742BR 19 JB 280 0075 0140 BH5487234 14 JB 19 JB 280 0075 0150 BH48872BC 7 JB 19 JB 190 0075 0150 BH48872BR 7 JB 190 0075 0150 BH48872BR 7 JB 120 0075 0160 BH58872BR 6 JB 15 JB 420 0078 0050 BH518712BT 6 JB 180 0078 0050 BH518717BR 6 JB 180 0078 0120 BH518717BR 6 JB 180 0078 0120 BH52872BH 6 JB 180 0078 0140 BH52872BH 6 JB 180 0078 0140 BH52872CT 6 JB 180 0140 BH	075 0080 075 0090 075-0100 075-0100 075 0150 075 0160 075 0160MS atch 8709-078 ** 078 0001BL 078 0040 078 0050		0 4 9 0		
075 0000 BH5487234 13 JB 280 075 0140 BH5487234 14 JB 191 075 0140 BH5487234 6 JB 191 075 0150 BH5487245T 7 JB 91 075 0160NS BH548724BR MS 7 JB 112 075 0160NS BH548724BR MS 7 JB 116 075 0160NS BH5487124BR MS 7 JB 116 078 0040 BH5187124T 6 JB 300 078 0040 BH5187124T 6 JB 300 078 0040 BH5187174CT 6 JB 300 078 0040 BH5187174CT 6 JB 300 078 0140 BH528722CT 6 JB 870 078 0140 BH528722CT 6 JB 870 078 0140 BH528722CT 6 JB 870 078 0140 BH528724BR 15 JB 80 078 0140 BH528724BR 16 JB 870 078 0140 BH528724BR 16 JB 870 078 0160 BH5987004C 6 JB 870 016 0060 BH5987004C 6 JB 35 016 0060 BH5987004C 6 JB 37 017 JJ 88 016 0060 BH5987004C 6 JB 37 017 JJ 88 018 019 BH5987004C 6 JB 37 019 019 BH5987004C 7 JJ 37 019 019 019 BH5987004C 7 JJ 37 019 019 019 BH5987004C 7 JJ 37 019 019 019 019 BH5987004C 7 JJ 37 019 019 019 019 019 019 019 019 019 019	075 0090 BH6487042D 113 JB 280 075 0100 BH6487234 14 JB 19 19 19 19 19 19 19 19 19 19 19 19 19	075 00900 BH5487042D 113 JB 280 075 0100 BH5487042D 19 13 JB 280 075 0140 BH468722CT 6 JB 19 190 075 01600 BH49872CT 7 JB 190 075 01600 BH49872CT 7 JB 120 075 01600 BH518712WT 6 JB 300 078 0040 BH518712WT 6 JB 300 078 0040 BH518712WT 6 JB 300 078 0040 BH518712WT 6 JB 300 078 0120 BH528712DH 6 JB 300 078 0120 BH528712DH 6 JB 85 078 0140 BH528712DH 6 JB 85 078 0140 BH528712DH 6 JB 86 078 0140 BH528712DH 6 JB 86 078 0140 BH528712DH 6 JB 86 078 0150 BH528710DD 6 JB 87 078 0150 0050 BH528710DD 6 JB 87 078 0150 0050 BH528710DD 6 JB 97 075 0050 BH528710D 6 J	075 0090 075-0100 075 0140 -075 0150 075 0160 075 0160MS atch 8709-078 ** 078 0001BL 078 0040 078 0050 078-0060		849666		
075-0100 BH54872334 14 JB 190 075 0150 BH5487200C 7 JB 91 075 0150 BH498720CT 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH518712WT 6 JB 300 078 0001BL BH518712WT 6 JB 300 078 0000 BH518712WT 6 JB 300 078 0000 BH518712WT 6 JB 300 078 0100 BH518712WT 6 JB 300 078 0100 BH528712WH 6 JB 300 078 0140 BH52872CT 6 JB 890 078 0140 BH52872CT 15 JB 890 078 0140 BH52870010 6 JB 890 078 0140 BH52870010 6 JB 890 078 0140 BH5287000	075-0100 BH54872334 190 075 0150 BH54872034 191 075 0150 BH5487200C	075-0100 BH5647234 14 JB 190 075-0100 BH6847234 14 JB 190 075 0160 BH498722CT 7 JB 91 075 0160 BH49872CT 7 JB 120 075 0160WS BH49872CT 7 JB 120 075 0160WS BH49872CT 7 JB 120 078 0001BL BH58172WT 6 JB 180 078 -0040 BH518717BT 6 JB 180 078 -0100 BH518717BT 6 JB 180 078 -0100 BH52872CT 6 JB 180 078 -010 BH52872CT 6 JB 180 078 -010 BH52870CT 10 JJ 180 016 -0001BL BH58870CT 10 JJ 190 016 0050 BH59870CT 10 JJ 180 016 0050 BH59870CT 10 JJ 180 017 0050 BH59870CT 10 JJ 180 018 -0001BL BLANK 10/29 35 018 -0001BL BLANK 10/29 35 018 Not detection limit of 50 ug/kg)	075-0100 075 0140 -075 0150 075 0160 075 0160MS atch 8709-078 ** 078 0001BL 078 0040 078 0050 078-0060	134 2CT 1BR 1BR	4922		
075 0140 BH49872CUC 6 JB 91 075 0160 BH49872CT 7 JB 92 075 0160MS BH49872CT 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 078 0040 BH518712WT 6 JB 300 078 0040 BH518712WT 6 JB 300 078 0040 BH528712DH 6 JB 300 078 010 BH528712DH 6 JB 300 078 010 BH528712DH 6 JB 300 078 0140 BH528724BR 15 JB 94 078 0140 BH528724BR 15 JB 38 0160 0160 BH598704UC 7 J J 88 0160 0160 BH598704UC 7 J J 98 016 0050 BH598709BR 6 JB 100 016 0050 BH598709BR 6 JB 30 016 0050 BH598709BR 6 JB 30 016 0050 BH598709BR 6 JB 30 0178 0140 BH598709BR 6 JB 30 018 0050 BH598709BR 6 JB 30 019 0050 BH598709BR 7 JB 30 019 0050 BH598709BR 7 JB 30 019 0050 BH598709BR 7 JB 30	075 0140 BH498720UC 6 JB 91 075 0160 BH49872CT 7 JB 90 075 0160 BH49872CT 7 JB 140 075 0160 BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 078 0040 BH518712WT 6 JB 300 078 0040 BH5187174CT 6 JB 42 078 0040 BH5187174CT 6 JB 42 078 0040 BH52872CT 6 JB 87 078 0140 BH52872CT 6 JB 87 078 0160 BH598704UC 15 JB 16 JB 88 016 0040 BH598707CT 10 J J 10 J 100 016 0050 BH598707CT 10 J J 10 J 100 016 0050 BH598709BR 6 JB 180 025-0001BL BLANK 10/29 - 335 025-0001BL BLANK 10/29 - 000 MG tection limit 0	075 0140 BH498720UC 6 JB 91 075 0160 BH498722CT 7 JB 90 075 0160 BH498722CT 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 078 0001BL BLANK 9/28 6 JB 420 078 0040 BH518712WT 6 JB 300 078-0100 BH518717BH 6 JB 43 078-0110 BH528722CT 6 JB 81 078-0110 BH598707CT 6 JB 81 016 0040 BH598707CT 10 J J 88 016 0040 BH598707CT 6 JB 10 016 0040 BH598707CT 6 JB 81 016 0040 BH598707CT 6 JB 81 017 JJ 88 018 0160 BH598709BR 6 JB 33 018 0160 BH598709BR 6 JB 34 018 018 018 018 018 018 018 018 018 018	075 0140 -075 0150 075 0160 075 0160MS atch 8709-078 ** 078 0001BL 078 0040 078 0050 078-0060	CT IBR	9		
0075 0150 BH498722CT 7 JB 90 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 076 0001BL BHANK 9/28 15 JB 300 078 0000 BH518712WT 6 JB 300 078 0040 BH518714CT 6 JB 300 078 0120 BH518717BR 6 JB 420 078 0120 BH518717BR 6 JB 810 078 0130 BH518712CT 6 JB 810 078 0140 BH52872CT 6 JB 810 078 0140 BH52870CT 7 J 88 016 0050 BH59870CT 7 J 9 810 016 0050 BH59870CT 6 JB 110 017 016 0050 BH59870CT 6 JB 110 018 0050 BH59870CT 6 JB 110 019 0050 BH59870CT 6 JB 110 010 010 010 BH59870CT 6 JB 110 010 010 BH59	075 0150 BH498722CT 7 JB 90 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 076 0001BL BLANK 9/28 15 JB 420 078 0040 BH518712WT 6 JB 420 078 0040 BH518714CT 6 JB 420 078 0040 BH518714CT 6 JB 6 JB 420 078 0120 BH518717BR 6 JB 81 078 0120 BH52872CT 6 JB 81 078 0140 BH52872CT 6 JB 81 078 0140 BH528724BR 15 JB 89 078 0140 BH528724BR 15 JB 89 078 0160 BH598704UC 15 JB 180 078 0160 BH598704UC 6 JB 10 J 100 078 0160 0040 BH598709BR 6 JB 10 JB 11 025-0001BL BLANK 10/11 - 35 025-0001BL BLANK 10/29 - 35	075 0150 BH498722CT 7 JB 90 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 140 078 00010L BLANK 9/28 15 JB 300 078 0000 BH518712WT 6 JB 300 078 0050 BH518712WT 6 JB 300 078 0050 BH528702DT 6 JB 871 078 0120 BH528702DT 6 JB 891 078 0140 BH528722CT 6 JB 891 078 0140 BH52872CT 6 JB 891 078 0140 BH528724BR 15 JB 891 078 0140 BH528707CT 6 JB 891 078 0160 BH598707CT 10 JB 891 016 0060 BH598709BR 6 JB 93 016 0060 BH598709BR 6 JB 871 025-0001BL BLANK 10/29 335 025-0001BL BLANK 10/29 335 025-0001BL BLANK 10/29 IBM1 0 Present in laboratory blank 0 Not detected (detection limit of 50 ug/kg)	-075 0150 075 0160 075 0160MS atch 8709-078 ** 078 0001BL 078 0050 078-0060	CCT IBR IBR WT	2 2		
075 0160 BH488724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 078 0001BL BLANK 9/28 15 JB 46 078 0040 BH518712WT 6 JB 300 078 0040 BH518712WT 6 JB 420 078 0120 BH52870010 6 JB 420 078 0120 BH528712DH 6 JB 420 078 0130 BH52872CT 6 JB 88 078 0140 BH52872LBR 15 JB 94 atch 8710-016 ** 16 JB 40 160 040 BH528704UC 7 J 88 016 0050 BH598707CT 7 J 88 016 0060 BH598709BR 6 J 9 161 0060 BH598709BR 6 J 9 025-0001BL BLANK 10/29 - 9 18 Fresent in laboratory blank - 35	075 0160 BH488724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 075 0160MS BH498724BR MS 7 JB 120 078 0001BL BLANK 9/28 15 JB 300 078 0040 BH518712WT 6 JB 300 078 0050 BH518717BR 6 JB 72 078-0110 BH528712TH 6 JB 87 078-0110 BH52872TH 6 JB 87 016 0040 BH588704UC 7 J 9 88 016 0040 BH598704UC 7 J 9 88 016 0040 BH598709BR 6 JB 9 015 0050 BH59	075 0160 BH488724BR MS 7 JB 120 140 1410 1410 1410 1410 1410 1410 1	075 0160 075 0160MS atch 8709-078 ** 078 0001BL 078 0050 078-0060	IBR IBR WT	9		
Atch 8709-078 ** 078 0001BL BLANK 9/28	Atch 8709-078 ** 078 0001BL BLANK 9/28 15 JB 300 078 0040 BH518712WT 6 JB 300 078 0040 BH518712WT 6 JB 300 078 0040 BH518712WT 6 JB 420 078-010 BH518712DH 6 JB 43 078-0110 BH52872CT 6 JB 80 078-0130 BH52872CT 6 JB 80 078-0130 BH528724BR 15 JB 94 atch 8709-380 ** 180 0160 BH5387300D 15 J 180 180 0160 BH598707CT 6 JD J 180 180 0160 BH598707CT 6 JD J 180 180 0160 BH598709BR 6 JB 887 180 0160 BH598707CT 6 JD J 180 180 0160 BH598707CT 6 JD J 180 181 Atch 8710-025 ** 025-0001BL BLANK 10/29 - 35 18 BF598707CT 6 JB 180 18 BF598707CT 6 JB 180 18 BH598707CT 7 J 3 SB 18 BH598707CT 6 JB 180 18 BH598707CT 7 J 3 SB 18 BH598709BR 6 JB 180 18 BH598707CT 7 J 3 SB 18 BH598707CT 8 SB 18 BH59870	Atch 8709-078 ** 078 0001BL BLANK 9/28	ore cross ** ore 0001BL ore 0040 ore 0050 ore 0050	28 W.T	. .		
15 J 45 J 6 JB 16 JB 400 BLANK 9/28	15 0 0 0 15 0 0 0 0 0 0 0 0 0 0 0 0 0 0	100 0010 0010 0010 0010 0010 0010 0010	atch 8709-078 ** 078 0001BL 078 0040 078 0050 078-0060	9/28 12WT	က		
078 0001BL BLANK 9/28	078 0001BL BLANK 9/28 15 J 45 300 078 0040 BH518712WT 6 JB 6 JB 420 078 0050 BH518712WT 6 JB 728 078-0050 BH518717BR 6 JB 728 078-0110 BH528702CT 6 JB 80 078-0130 BH52872CT 6 JB 80 078 0140 BH52872CT 15 JB 94 34ch 8709-380 ** BH528724BR 15 JB 15 JB 94 34ch 8709-380 ** BH528724BR 15 JB 15 JB 94 34ch 8710-016 ** BH528704UC 15 JB 15 JB 100	078 0001BL BLANK 9/28	078 0001BL 078 0040 078 0050 078-0060	9/28 12WT	ις.		
078 00400 BH518712WT 6 JB 300 078 00500 BH518714CT 6 JB 420 078-0060 BH518714CT 6 JB 420 078-0010 BH528710010 6 JB 43 078-0110 BH528712DH 6 JB 51 078-0130 BH52872CT 6 JB 80 078 0140 BH52872CT 6 JB 80 078 0140 BH528724BR 15 JB 894 078 0140 BH528724BR 15 JB 180 078 0160 0160 BH4387300D 15 J 180 016 0040 BH598704UC 7 016 0060 BH598704UC 7 016 0060 BH598709BR 6 J 10 025-0001BL BLANK 10/29 35 025-0001BL BLANK 10/29 35	0.78 0.0400 BH518712WT 6 JB 300 0.78 0.050 BH518714CT 6 JB 420 0.78 0.050 BH518717BR 6 JB 420 0.78 0.010 BH528710010 6 JB 43 0.78 0.010 BH52872CT 6 JB 80 0.78 0.0140 BH52872CT 6 JB 80 0.78 0.0140 BH52872CT 6 JB 80 0.015 0.0160 BH52872CT 15 JB 80 0.016 0.050 BH598700CT 15 J 180 0.016 0.050 BH598709BR 6 J 10 J 100 0.016 0.050 BH598709BR 6 J 38 0.025-0001BL BLANK 10/11 6 J 100 J 30 0.025-0001BL BLANK 10/29 35 0.025-0001BL BLANK 10/29 35 0.025-0001BL BLANK 10/29 004 detection limit of 50 mg/kg)	078 0040 078 0050 08 BH518714CT 078 0050 08 BH518714CT 078 0050 08 BH518717BR 078 0120 078-0060 08 BH52870010 078 0120 078 0120 08 BH52872CT 078 0130 08 BH52872CT 078 0140 08 BH52872CT 016 0060 08 BH528724BR 016 0060 08 BH598704UC 016 0060 08 BH598704UC 016 0060 08 BH598704UC 016 0060 08 BH598709BR 025-0001BL 025-0001BL 025-0001BL 03 EStimated concentration below detection limit 0.00000000000000000000000000000000000	078 0040 078 0050 078-0060	12WT	۵		
078 0050 BH518714CT 6 JB 700 078 0050 BH518714CT 6 JB 720 078 0050 BH518714CT 6 JB 712 078 0120 BH52870010 6 JB 712 078 0120 BH52872CT 6 JB 80 078 0140 BH52872CT 6 JB 80 078 0140 BH528724BR 15 JB 94 078 0160 BH4387300D 15 J 15 J 180 140 0160 BH598704UC 10 J 10	078 0050 BH51871477 6 JB 430 078-0060 BH51871477 6 JB 72 078-010 BH52870010 6 JB 72 078-0110 BH52870207 6 JB 80 078-0130 BH5287227 6 JB 80 078-0130 BH5287227 6 JB 80 078-0140 BH5287227 6 JB 80 078-0140 BH5287227 6 JB 80 078-0150 BH528724BR 15 JB 180 180 0160 BH4387300D 15 J 180 180 160 0040 BH598704UC 7 J 88 016 0050 BH598707CT 6 JB 100 J 100 J 100 016 0050 BH598709BR 6 J 38 025-0001BL BLANK 10/29 - 35 025-0001BL BLANK 10/29 - 35 025-0001BL BLANK 10/29 - 35 025-0001BL BLANK 10/29 - 35	078 0050 BH1871477 6 JB 720 078 0050 BH51871477 6 JB 72 078 0050 BH51871787 6 JB 72 078 0120 BH52870010 6 JB 843 078 0120 BH528712DH 6 JB 86 078 0140 BH5287227 6 JB 86 078 0140 BH5287227 6 JB 86 078 0140 BH528724BR 15 JB 15 JB 894 078 0160 0160 0060 BH588704DC 7 J J 88 0160 0050 BH598704DC 7 J J 88 0160 0050 BH598707CT 10 J J 10 J 100 J 100 J 100 016 0050 BH598709BR 6 J 38 0160 0050 BH598709BR 6 J 30 0160 0050 BH598709	078 0050 078-0060	1 4 7 1			
720 778-0060 BH51817BR G JB 720 778-0110 BH52870010 BH528702T BH52872CT BH52870CCT CO16 BH59870CT BH59870CT BH59870CT BH59870CT CO16 BH59870CT	720 778-0060 8452870010 8452870010 8452870010 8452870010 8452872CT 6 JB 8709-380 ** 380 0160 814387300D 814387300D 815 J 8180 825-0001BL 814387300D 815 J 815 J 816 050 815 J 817 J 8180 8180 8180 8180 8180 8180 8180 818	720 778-0060 8H52870010 8H52870010 8H52870010 8H52870010 8H52870010 8H52872CT 6 JB 8 6 18 078-0130 8H52872CT 8 JB 8 6 JB 8 8 94 43 6 JB 8 8 94 8 94 8 10-016 ** 8 10-016 ** 8 10-016 BH5987040C 9 10 J 9 10 J 8 10-016 0060 8 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	078-0060	£27.			
0.78-0.00 0.78-0.10 0.78-0.10 0.78-0.10 0.78-0.10 0.78-0.10 0.78-0.10 0.78-0.10 0.78-0.10 0.78-0.10 0.78-0.10 0.78-0.10 0.78-0.10 0.88-0.10 0.88-0.10 0.89-0.10 0.89-0.10 0.16-0.00	0.78-0.00 0.78-0.00 0.78-0.10 0.78-0.10 0.78-0.13 0.79-0.13 0.88-0.13 0.89-0.13 0.99-0.13 0.99-0.13 0.99-0.13 0.99-0.13 0.99-0.13 0.99-0.13	Ora-0000 BH528712DH 6 JB 72 72 73 73 74 74 75 75 75 75 75 75	0000-010	1401			
0.78 0120 BH528712DH 6 JB 51 0.78 0130 BH528722T 6 JB 80 0.78 0140 BH528724BR 15 JB 94 atch 8709-380 ** BH528724BR 15 JB 180 380 0160 BH4387300D 15 J 180 atch 8710-016 ** 40 016 0060 BH598704UC 7 J 88 016 0060 BH598709BR 6 J 88 atch 8710-025 ** 6 J 81 025-0001BL BLANK 10/29 35 B Fesent in laboratory blank	078 -0120	0.78 -0.150	070.0110	1.00			
0.78 0120 BH528722CT 6 JB 80 078 0140 BH528722CT 6 JB 80 078 0140 BH528724BR 15 JB 94 078 0140 BH528724BR 15 JB 180 016 0160 BH5387300D 15 J 180 016 0060 BH598704UC 7 J 9 88 016 0060 BH598709BR 6 J 88 025-0001BL BLANK 10/29 - 35 025-0001BL BLANK 10/29 - 35	0.78 0120 BH528722CT 6 JB 80 94 1428 0140 BH528722CT 6 JB 80 94 1426 0140 BH528722CT 6 JB 80 94 1426 0160 BH528720CT 15 J 180 180 1426 0160 BH598704UC 10 J 10 J 100 J 100 J 100 J 100 J 100 BH598707CT 10 J 10 J 100 J	0.78 0140 BH52872CT 6 JB 80 94 15 018 0140 BH52872CT 6 JB 80 94 15 018 0140 BH52872CT 6 JB 94 94 15 0160 BH4387300D 15 J 180 180 1160 BH598704UC 7 J 10 J 100 J 10	078-0110	1300			
atch 8709-380 ** atch 8709-380 ** 380 0160	atch 8709-380 ** atch 8709-380 ** 380 0160	atch 8709-380 ** atch 8709-380 ** 380 0160	078-0130	1221			
atch 8709-380 ** 380 0160 BH4387300D 15 J 180 atch 8710-016 ** -016-0001BL BH598704UC -016 0050 BH598707CT -016 0060 BH598707CT -016 0060 BH598709BR atch 8710-025 ** 025-0001BL BLANK 10/29 35 B Present in laboratory blank B Present in laboratory blank	atch 8709-380 ** 380 0160 BH4387300D 15 J 180 atch 8710-016 ** -016-0001BL BH598704UC 7 J 888 016 0050 BH598707T 10 J 87 atch 8710-025 ** s J Estimated concentration below detection limit b bresent in laboratory blank below detection limit of 50 us/ks)	atch 8709-380 ** 380 0160 BH4387300D 15 J 180 atch 8710-016 ** -016-0001BL BH598704UC 7 J 888 016 0050 BH598707CT 10 J 877 atch 8710-025 ** 025-0001BL BLANK 10/29 - 35 s J Estimated concentration below detection limit B Present in laboratory blank B Not detected (detection limit of 50 ug/kg)	078 0140	24BR			
tch 8709-380 ** 380 0160 BH4387300D 15 J 180 tch 8710-016 ** 016-0001BL BH598704UC 7 J 88 016 0050 BH598707CT 10 J 10 J 016 0060 BH598707CT 6 J 3 87 tch 8710-025 ** J Estimated concentration below detection limit B Present in laboratory blank	tch 8709-380 ** 380 0160 BH4387300D 15 J 180 tch 8710-016 ** 016-0001BL BH598704UC 7 J 88 016 0040 BH598707CT 10 J 100 016 0050 BH598707CT 6 J 3 88 tch 8710-025 ** J Estimated concentration below detection limit B Present in laboratory blank Not detected (detection limit of 50 ms/kg)	tch 8709-380 ** 380 0160 BH4387300D 15 J 180 tch 8710-016 ** 016-0001BL BH598704UC 7 J 88 016 0050 BH598707CT 10 J 100 J 016 0050 BH598709BR 6 J 87 tch 8710-025 ** J Estimated concentration below detection limit B Present in laboratory blank Not detected (detection limit of 50 ug/kg)					
380 0160 BH4387300D 15 J 180 tch 8710-016 ** 016-0001BL BH598704UC - 40 016 0040 BH598704UC 7 J 88 016 0050 BH598707CT 10 J 88 016 0060 BH598709BR 6 J 87 1ch 8710-025 ** 025-0001BL BLANK 10/29 - 35 J Estimated concentration below detection limit B Present in laboratory blank	380 0160 BH4387300D 15 J 180 tch 8710-016 ** 016-0001BL BH598704UC 7 J 88 016 0050 BH598707CT 10 J 87 10 0 J BH598707CT 6 J 87 tch 8710-025 ** 025-0001BL BLANK 10/29 - 35 J Estimated concentration below detection limit B Present in laboratory blank but detected (detection limit of 50 ms/kg)	tch 8710-016 ** 016-0001BL BI ANK 10/11	Batch 8709-380				
tch 8710-016 ** 016-0001BL BI ANK 10/11 016 0040 BH598704UC 7 J 88 016 0050 BH598707CT 10 J 100 J 016 0060 BH598709BR 6 J 87 1ch 8710-025 ** 025-0001BL BLANK 10/29 - 35 J Estimated concentration below detection limit B Present in laboratory blank	tch 8710-016 ** 016-0001BL B1ANK 10/11 016 0040 BH598704UC 7 J 88 016 0050 BH598707CT 10 J 100 016 0060 BH598709BR 6 J 87 1ch 8710-025 ** 35 025-0001BL BLANK 10/29 - 35 J Estimated concentration below detection limit B Present in laboratory blank - Not detected (detection limit of 50 ms/kg)	tch 8710-016 ** 016-0001BL BI ANK 10/11 016 0040 BH598704UC 7 J 88 016 0050 BH598707CT 10 J 100 016 0050 BH598709BR 6 J 87 1ch 8710-025 ** 025-0001BL BLANK 10/29 - 35 J Estimated concentration below detection limit B Present in laboratory blank - Not detected (detection limit of 50 ug/kg)	380 0160	300D	2		
016-0001BL BI ANK 10/11 - 40 016 0040 BH598704UC 7 J 88 016 0050 BH598709BR 6 J 87 10 J 87 10 L 6 J 87 10 C 100 J 87 100 J 88 100	016-0001BL BI ANK 10/11 - 40 016 0040 BH598704UC 7 J 88 016 0050 BH598707CT 10 J 100 016 0060 BH598709BR 6 J 87 025-0001BL BLANK 10/29 - 35 025-0001BL BLANK 10/29 - 35 025-0001BL Bresent in laboratory blank B Present in laboratory blank B Present in laboratory blank B Present in laboratory blank B B B B B B B B B B B B B B B B B B B	016-0001BL BI ANK 10/11 - 40 016 0040 BH598704UC 7 J 88 016 0050 BH598709BR 6 J 87 016 0060 BH598709BR 6 J 87 025-001BL BLANK 10/29 - 35 J Estimated concentration below detection limit B Present in laboratory blank	Batch 8710-016				
016-0001BL BIANK 10/11 - 40 016 0040 BH598704UC 7 J S 88 016 0050 BH598709BR 6 J 87 10 J BH598709BR	016-0001BL BIANK 10/11 - 40 016 0040 BH598704UC 7 J 9 88 016 0050 BH598709BR 6 J 87 016 0060 BH598709BR 6 J 87 025-0001BL BLANK 10/29 - 35 J Estimated concentration below detection limit B Present in laboratory blank - Not detected (detection limit of 50 ms/kg)	016-0001BL BIANK 10/11 - 40 016 0040 BH598704UC 7 J 88 016 0050 BH598707CT 6 J 10 J 100 016 0060 BH598709BR 6 J 87 10 J 8710-025 ** 10 J BLANK 10/29 - 35 Stimated concentration below detection limit					
016 0040 BH598704UC 7 J 9 88 016 0050 BH598707CT 10 J 10 J 016 0060 BH598709BR 6 J 87 100 C J 8710-025 ** 100 J BLANK 10/29 35 SESTIMATED CONCENTRATION below detection limit B Present in laboratory blank B Present in laboratory blank	016 0040 BH598704UC 7 J 9 88 016 0050 BH598707CT 10 J 100 J 016 0060 BH598709BR 6 J 87 100 C J 8710-025 ** 100 J BLANK 10/29 - 35 Stimated concentration below detection limit B Present in laboratory blank B B B B B B B B B B B B B B B B B B B	016 0040 BH598704UC 7 J 9 88 016 0050 BH598707CT 10 J 10 J 016 0060 BH598709BR 6 J 87 025-001BL BLANK 10/29 - 35 J Estimated concentration below detection limit B Present in laboratory blank - Not detected (detection limit of 50 ug/kg)	-0001BL BI ANK	10/11			
016 0050 BH598707CT 10 J 100 016 0050 BH598709BR 6 J 87 100 016 0060 BH598709BR 6 J 87 87 87 87 100 025-0001BL BLANK 10/29 - 35 35 35 85 1mated concentration below detection limit B Present in laboratory blank	016 0050 BH598707CT 10 J 100 J 016 0060 BH598709BR 6 J 87 87 87 87 100 .tch 8710-025 ** 025-0001BL BLANK 10/29 - 35 J Estimated concentration below detection limit B Present in laboratory blank B Present in laboratory blank - Not detected (detection limit of 50 ms/kg)	016 0050 BH598707CT 10 J 100 J 016 0060 BH598709BR 6 J 87 tch 8710-025 ** 025-001BL BLANK 10/29 35 J Estimated concentration below detection limit B Present in laboratory blank Not detected (detection limit of 50 ug/kg)	016 0040	04UC			
016 0060 BH598709BR 6 J 87 tch 8710-025 ** 025-0001BL BLANK 10/29 - 35 J Estimated concentration below detection limit B Present in laboratory blank	016 0060 BH598709BR 6 J 87 tch 8710-025 ** 025-0001BL BLANK 10/29 - 35 J Estimated concentration below detection limit B Present in laboratory blank - Not detected (detection limit of 50 ms/kg)	tch 8710-025 ** tch 8710-025 ** 025-001BL BLANK 10/29 - 35 J Estimated concentration below detection limit B Present in laboratory blank - Not detected (detection limit of 50 ug/kg)	016 0050	07CT			
tch 8710-025 ** 025-0001BL BLANK 10/29 35 J Estimated concentration below detection limit B Present in laboratory blank	tch 8710-025 ** 025-0001BL BLANK 10/29 35 J Estimated concentration below detection limit B Present in laboratory blank - Not detected (detection limit of 50 mg/kg)	tch 8710-025 ** 025-0001BL BLANK 10/29 - 35 J Estimated concentration below detection limit B Present in laboratory blank - Not detected (detection limit of 50 ug/kg)	-016 0060	09BR		_	
025-0001BL BLANK 10/29 35 J Estimated concentration below detection limit B Present in laboratory blank	025-0001BL BLANK 10/29 35 J Estimated concentration below detection limit B Present in laboratory blank - Not detected (detection limit of 50 mg/kg)	025-0001BL BLANK 10/29 - 35 J Estimated concentration below detection limit B Present in laboratory blank - Not detected (detection limit of 50 ug/kg)	Batch 8710-025 *				
025-0001BL BLANK 10/29 35 J Estimated concentration below detection limit B Present in laboratory blank	025-0001BL BLANK 10/29 35 J Estimated concentration below detection limit B Present in laboratory blank - Not detected (detection limit of 50 mg/kg)	025-0001BL BLANK 10/29 - 35 J Estimated concentration below detection limit B Present in laboratory blank - Not detected (detection limit of 50 ug/kg)		,			
J Estimated concentration below B Present in laboratory blank	J Estimated concentration below B Present in laboratory blank - Not detected (detection limit	J Estimated concentration below B Present in laboratory blank - Not detected (detection limit	025-0001BL	10/29	ì		
Present	Present in Laboratory blank Not detected (detection limit of 50	Present in laboratory blank Not detected (detection limit of 50	J Estimated	3	detection limit		
Not detected (detection limit of 50		Not detected (detection limit of 50	Present	4	Ċ		
A Not analyzed	Not analyzed	ACA TON	Not analyzed	1 1 m 1 C	2		

903 PAD MOUND AND EAST TRENCHES AREAS REMEDIAL INVESTIGATION REPORT ROCKY FLATS PLANT GOLDEN COLORADO DRAFT **DECEMBER 31 1987**

TABLE 4 2 VOLATILE ORGANICS IN SOILS	POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION	(\(\alpha \alpha \rangle \)
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710 0.25-0050 BH5787 710 0.25 0.060 BH5787 710 0.25 0.080 BH5787 710 0.25 0.080 BH5787 710 0.25 0.080MS BH5787 710 0.25 0.080MS BH5787 710 0.32 0.130 BH5787 710 0.32 0.140 BH5787 710 0.32 0.150 BH5787 710 0.32 0.160 BH5787 710 0.32 0.190 BH5787 710 0.32 0.190 BH5787 710 0.32 0.200 BH5887 710 0.32 0.200 BH5887 710 0.32 0.200 BH5887	04DH 08DH 10UC 12CT 12CT MS 10/30 14BR 16DH 18DH			
9000 9000 9000 9000 9000 9000 9110	•		79 B	
90000 90000 90000 90000 90000 90000 901000 90100 90100 90100 90100 90100 90100 90100 90100 901000 90100 90100 90100 90100 90100 90100 90100 90100 901000 90100 90100 90100 90100 90100 90100 90100 90100 901000 90100 90100 90100 90100 90100 90100 90100 90100 901000 901000 90100 90100 90100 90100 90100 90100 90100 90100 901000 90100 90100 90100 90100 90100 90100 90100 90100 901000 90100 90100 90100 90100 90100 90100 90100 90100 901000 90100 90100 90100 90100 90100 90100 90100 90100 901000 90100 90100 90100 90100 90100 90100 90100 90100 901000 90100 90100 90100 90100 90100 90100 90100 90100 901000 90100 90100 90100 90100 90100 90100 90100 90100 901000 90100 90100 90100 90100 90100 90100 90100 90100 901000 90100 90100 90100 90100 90100 90100 90100 90100 901000 90100 90100 90100 90100 90100 90100 90100 90100 901000 90100 90100 90100 90100 90100 90100 90100 90100 901000 90100 90100 90100 90100 90100 90100 90100 90100 901000 90100 90100 90100 90100 90100 90100 90100 90100 90100 90100 90100 90100 90100 90100 90100 90100 90100 90100	•			1
8710 032 ** 8710 032 ** 000130 BH5787 0130 BH5787 0140 BH5787 0150 BH5787 0160 BH5787 0170 BH5787 0190 BH5787 0190 BH5787 0220 BH5887 0220 BH5887	0			
8710 032 ** 8710 032 ** 0001BL BLANK 0130 BH5787 0140 BH5787 0150 BH5787 0160 BH5787 0170 BH5787 0190 BH5787 0190 BH5787 0220 BH5887 0220 BH5887	0			
8710 032 ** 0001BL BLANK 0130 BH5787 0140 BH5787 0150 BH5787 0170 BH5787 0180 BH5787 0190 BH5787 0220 BH5887 0220 BH5887 0230 BH5887	10/30 4 BR (6DH (8DH		120 BNS	ı
0001BL BLANK 0130 BH5787 0140 BH5787 0150 BH5787 0160 BH5787 0180 BH5787 0190 BH5787 0190 BH5787 0200 BH5787 0220 BH5887 0230 BH5887	10/30 4BR 6DH 8DH			
0130 BH5787 0140 BH5787 0150 BH5787 0160 BH5787 0170 BH5787 0110 BH5787 0190 BH5787 0200 BH5787 0210 BH5887 0220 BH5887	4 BR 6 DH 8 DH		u 0	
01130 01140 01150 01160 01180 01190 0220 0230	46DH (6DH (8DH	C 02		100
0150 0160 0170 0180 0190 0220 0230	HQ8		2008 2008	46
0160 0170 0180 0190 0200 0220 0230	::::			2 1
0170 0180 0190 0200 0220 0230	SODH .			62
0180 0190 0200 0210 0230	2DH	26 B		•
0190 0200 0210 0220 0230	24DH			
032-0200 032 0210 032 0220 -032 0230	HQ97	6 JB	65 B	•
032 0210 032 0220 -032 0230	8DH	ı		•
032 0220 -032 0230	00C	25 JB		
710-032 0230)2CT		120 B	
)4BR	19 JB		
** Batch 8710 040 **				
8710 040 0001BL BLANK 10/26 8710 040 0020 BH618707DH	10/26 37DH		1 1	1 1
** Batch 8710 051 **				
8710 051-0001BL 8710 051-0030 BH618709CT 8710 051 0060 BH618712BR	12BR	13 J 19 J	1 1 1	1 1
** Batch 8710 056 **				
8710 056-0001BL BH638712DH 8710-056 0030 BH638712DH 8710-056-0040 BH63870008	12DH 0008	- 30 15 J	111	1 1 1
** Batch 8710-063 **				
8710 063-0001BL			1	•
Notes J Estimated conce B - Present in labo	d concentration below in laboratory blank cted (detection limit	concentration below detection limit laboratory blank sed (detection limit of 50 ug/kg)		
analyzed spiked				

	2 Butanone		i					•	
NTAM I NATION	Acetone	64	- 09		ı	i 1	•	ı	•
<pre>rable 4 2 VOLATILE ORGANICS IN SOILS POSSIBLY AITRIBUFABLE TO LABORATORY CONTAMINATION (ug/kg)</pre>	Methylene Chloride	16 J	13 J 18 J		r s	23 JB 23 JB	13 JB	12 JB	13 JB
VOL. POSSIBLY ATTRIB	Feld Sample Number	BH638718UC	BH638722CT BH638724BR			BH628714BR BH628712CT	BH62870008	вн6287008D	вн628702DH
	KFW Batch ID	063	8710 063 0050 8710 063 0060	** Batch 8710 073 **	8710 073 0001BL	8710 073-0010	8710 073 0070	8710 073-0080	8710 073-0100

Notes J Estimated concentration below detection limit
B Present in laboratory blank
- - Not detected (detection limit of 50 ug/kg)
NA Not analyzed
NS Not spiked

TABLE 4 3
SEMIVOLATILE ORGANICS IN SOILS
POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION
(ug/kg)

Fig. 2						
1. 8706 042 *** 0.12 00118. ALANK	KFW Batch 1D		N Nitrosodiphenylam ne	Dı n octylphthalate	Dı n-butylphthalate	Bis(2 ethylhexyl)phthalate
10 20 10 10 10 10 10 10		**				
10 20 20 20 20 20 20 20	3	200				
10 10 10 10 10 10 10 10	3 5	BLAINN BH29870010	ı			
10.00 PHE28913CFRR	042	BH298717WT				910 B
10 10 10 10 10 10 10 10	042	BH298716BR				18000 B
Colorest Higher 1 across	045	BH298713CT				470 B
120 120	042	BH298713CIMS				9 7011
1,000 1,00		88 **				
008 001011 H30871020						
1800 1800 1810871082 1800 18008 18	058	BLANK BU30871020	1			1200 B
1900 1900	028	BH308710WS	1			1500 B
1500 1500	058 058	BH308720WT BH308725BR				2100 B 1800 B
Note of the content		79				
March Marc	0100 650 5020	D10502000		I 086		1900 B
No.		BH258718BR		26 J	;	930 B
100 100	8706 062 0030	H125870910		75 J	63 J	8 086 8 086
Not of the state		** \$9				
100 100	8706 065 0020	BH258720WS				870 B
Not State	8706 065 0030	BH25870009				1100 B
1t h 8707 042 ** 1v h 8707 042 ** 1v h 8707 042 ** 1v color BH238708CT 042 0020 BH2387008 1v color BH238711BR 1v color BH2387008B 1v color BH2387008B 1v color BH2387008B 1v color BH2387000B 1v color BH238700B 1v color BH2387000B 1v color BH2387000B 1v color BH238700B 1v color B	ე 65 ×	BH258716CT BH258709WT				
042 0001BL BILAMK 3 J 2 J 042 0010 BH238708CT - 2 J 042 0020 BH23870008 - - 012 0030 BH238711BR - - 1t ł 8707 043 ** BIAMK 3 J 2 J 043 0040 BH23870008B 2 J s J st matcd concentration below detection l mit of 330 ug/kg) 2 J Not detected (detection limit of 330 ug/kg) Not detected (detection limit of sp ked NS Not sp ked	** Bath 8707 0	45 **				
042 0010 BH238708CT	047	BLANK				
042 0020 BH238711BR	042	BH238708CT				3300
012 0030 BH238711BR 1.	042	BH23870008		1		1600
1. t 8707 043 ** 013 0001BL	8707 012 0030	BH238711BR				2700
013 0001BL BLANK 3 J 2 J 043 0040 BH23870008D i. J Est mated concentration below detection 1 mit B Pre ent in laboratory blank Not detected (detection limit of 330 ug/kg) NA Not analyzed NS Not sp ked		43 **				
043 0040 BH23870008D i J Est mated concentration below detection 1 mit B Pre ent in laboratory blank Not detected (detection limit of 330 ug/kg) NA Not analyzed NS Not sp ked	8707 043 0001BL	BLANK			2 3	
J Est mated concentration below B Pre ent in laboratory blank Not detected (detection limit NA Not analyzed NS Not sp ked	8707 043 0040	BH23870008D				2300
Fre ent in laboratory blank Not detected (detection limit Not analyzed Not sp ked	ت		w detection 1 mit			
Not analyzed Not sp ked		re ent in laboratory blank	-			
Not		ot analyzed				

TABLE 4 3
SEMIVOLATILE ORGANICS IN SOILS
POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION
(ug/kg)

	Field Sample Number	N-Nitrogodiphenylamine	Di n-octylphthalate	Di n butyiphthalate	Bis(2 etnyinexyi)phtm
8707 043 0040MS 8 07 043 0050 8707 043 0060 8707 043 0070	BH23870008D MS BH27870010 BH278710CT BH278713BR		1 1		NS 230 J 340 220 J
** Lat h 8707 045 **					
8707 045 0001BI 8707 045 0010 8707 045 0020	BLANK BH248708BR BH248705CT	36 J		65 J	4 J 890 1200
** Bat h 8707 046 **					
	BLANK BH228710WS BH22871018				4 J 540 600
** Batch 8707 047 **	H22870009	1		C II	820
8707 047 0001BL 8707 047 0010	BLANK BH22870009D	35 J	1		4 J 650
047 047 047	BH228720CT BH228722BR BH228722BR MS	68 J		36 J	540 1600 NS
** Bat h 8707 059 **					
8707 0 3 0001BI 870 8707 05 3 0020 8 07 059 0020MS	BLANK BH288700WT BH28870104 BH28870104 MS	51 J		1 J 58 J U	1400 3400
** Bat h 8707 060 **					
8707 060 0010 8707 060 0020 8707 060 0030	BH288705WS BH288706CT BH288709UR			61 J 42 J 59 J	970 1600 2100
** Bat h 8707 061 **					
8707 061 0010	BH38870010			41 J	4600
Note J Estimated B Present Not detect	d concentration n laboratory bl	below detection limit ank limit of 330 ug/kg)			
NA Not analyz NS Not spiked		i			

TABLE 4 3
SEMIVOLATILE CREANICS IN SOILS
POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION
(ug/kg)

Krw Batch 1D	Field Sample Number	N-Nitrosodiphenylamine	Di-n-octylphthalate	Dı n butylphthalate	Bis(Z ethylhexyl)phthalate
8707 061 0020 8707 061 0030	BH388710WS BH388720BR			73 J 100 J	2500 12000
** Bat h 8707 073 **					
8707 073 0010 8707 073 0020	BH378705WS BH268706BR		_ 160 J		420 800
** Batch 8707 079 **					
8707 079 0010 8707 079 0010MS	BH37871113		ı		280 J
079 079	BH378725BR BH378721CT		1	41 J	420 550
** Bat h 8707 082 **					
8707 082 0001BL	BLANK BH368705WS			13	5 3
087	B436870005 B436870005		1 1	42 J	340
085	BH368720CT		ŀ	40 t	260 J
8707 082 0050 8707 082 0060	BH36870515 BH368723BR		1	83 J 38 J	480 360
** Latch 870 103 **					
8707 103 0010 8707 103 0020	M135870012 BH35870012D		ı	92 J	500 680
** Batch 8707 106 **					
8707 106 0001BI	BLANK Burr 871 FCF	2 J	1		4. 4.
999		ı	ı (320 J
8707 106 0030	EH358718BK MS		1		350 NS 220 J
** Batch 8707 110 **					
8707 110 0001BL 8707 110 0010	BLANK BH348718CT	33 J		2 J	3 J 250 J
Note J Estima B Presen Not de	Estimated concentration below detection limit Present in laboratory blank Not detected (detection limit of 330 ug/kg)	detection limit of 330 ug/kg)			
NA Not analyza NS Not sp ked	Not analyzed				

903 PAD MOUND AND EAST TRENCHES AREAS REMEDIAL INVESTIGATION REPORT ROCKY FLATS PLANT GOLDEN COLORADO DRAFT **DECEMBER 31 1987**

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TABLE 4-3
SEMIVOLATILE ORGANICS IN SOILS
POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION
(ug/kg)

17.0 10.0						
110 00.020	110	PH348791BB				
110 0030 BH33871545	110	BH348721BR MS				310 JNS
110 0040 BH348700CL	110	BH348715WS			50 J	
110 0050 HEIGHTONE 41 J 450 110 0050 HEIGHTONE 41 J 450 110 0050 HEIGHTONE 41 J 450 110 0050 HEIGHTONE 41 J - 450 110 0050 HEIGHTONE 41 J - 450 120 0050 HEIGHTONE 41 J - - 450 120 0050 HEIGHTONE 41 J - - 450 120 0050 HEIGHTONE 41 J - - - 450 120 0050 HEIGHTONE 41 J - - - - - - 450 120 0050 HEIGHTONE - - - - - - - 450 120 0050 HEIGHTONE - - - - - - - - -	110	BH348708CL	47 J		42 J	430
110 0060	110	BH34870008	42 J	,	t	450
110 0700 Hi3487815D 44 J 220. 22	110	BH34870815	43 J	,		
tch 8708 002 *** 002 0010	110	BH3487815D	44 J			
002 0010 H333716TF 49 J 460 002 002 002 002 003 H333716TF 41 J 100 002 003 003 H333716TF 41 J 100 002 004 003 H333700H 41 J 100 002 004 004 004 004 004 004 004 004 0						
002 0010 HR338712047 49 3 160 002 0020 HR33871918 42 3 160 002 0050 HR33870915 40 3 7 3 160 002 0050 HR33870915 40 3 7 3 270 002 0050 HR32871657						0.00
002 0020 HB338719KB	005	BH338720WT			1	
002 0040 H333870004 37 34 3 - 270 002 0050 H333870004 37 41 3 - 270 002 0050 H333870015 40 3 - 270 002 0050 H33387015 40 3 - 270 003 H332871627	00	PH338716CT			ı	
002 0060 H33870004 37 J 57 O02 0060 H33870004 41 J 57 J 57 O02 0060 H33870016 41 J 57 J 57 O02 0060 H33870016 41 J 57 J 57 O02 0060 H33870016 41 J 57 J 57 O02 0060 H3287108R	700	BH338719BR		ı		240 3
002 0060 H33870815 41 J 002 0060 H33871615 40 J 010 0020 H3387165 40 J 010 0020 H3287165	700	BH33870004			ı	5 072
Atch 8708 010 ** NICHO 6708 010 ** NICH 6708 0	000	BH33870815				0.5
tch 8708 010 ** H3228716CT 2700 281328716CT 2700 281328718BR 2 2810 281328716BR 281328716BR 281328716BR 281328716BR 281328716BB 28	005	PH3387815D			•	050
March Marc		*				
10 0020 Hi328718BR 310 0020 Hi328718BR - 310 0020 Hi328718BR - 310 0020 Hi328718BR - 310 0020 Hi32870815 - 310 0020 Hi32870815 - 310 0020 Hi32870815 - 310 0020 Hi31870013D Hi31870013D Hi31870013D Hi31870013D Hi31870013D Hi3187103T	8708 010-0010	PH328716CF			ı	270 J
Harden H	8708 010 0020	BH328718BR			•	6 9
100 0040 BH32870815 - 310 0040 BH32870815 - 310 0040 BH32870815 - 310 0040 BH32870815 - 310 0040 BH31870013 37 J 3	8708 010 0030	BH32870008	t			310 J
tch 8708 012 ** Color Col	8708 010 0040	BH32870815		,	•	310 J
tch 8708 012 *** 1012 0010	8708 010 0050	BH3287815D				260 J
High State Hig		*				
012 00.20 BH31870013D ST J J 490 10020Ms		BH31870013	41 J			580
10020MS	012	BH31870013D	37 J			490
Hard Hard Hard Hard Hard Hard Hard Hard	=	BH31870013D MS	SNC 64			350 NS
(tch 8708 030 *** 40 J 40 J 430 (tch 8708 030 *** 40 J <	012	BH318713CT				470
1tch 8708 030 ** 030 0001BL BLANK 030 0010 BH398700FS 33 J 030 0020 BH398702DH 030 0040 BH398704DH 030 0050 BH398712CC 030 0050 BH398714CT J Estimated concent ation below detection limit B Present in Jahoratory blank	017	BH318716BR				430
030 0001BL BLANK 030 0010 BH398700FS 33 J 370 030 0020 BH398702DH 030 0030 BH398702DH 030 0040 BH398712UC 030 0050 BH398712UC 030 0060 BH398714CT J Estimated concent ation below detection limit B Present in Jaboratory blank		*				
0.00	030	BLANK	51 J			
030 0020 BH398702DH - 370 030 0030 BH398704DH - 280 030 0040 BH398709FS - 360 030 0050 BH398712UC 030 0060 BH398714CT - 240 030 big	030	BH398700FS				
030 0030 BH398704DH - 280 030 0040 BH398712LC 030 0050 BH398714CT - 360 030 0060 BH398714CT - 240 030 big	030	BH398702DH				370
030 0040 BH398709FS - 360 030 0050 BH398712UC 030 0060 BH398714CT J Estimated concent ation below detection limit R Present in laboratory blank	030	BH398704DH				280 J
030 0050 BH398712UC 030 0060 BH398714CT 240 250 3 Estimated concent ation below detection limit Present in laboratory blank	030	BI1398709FS			ı	
030 0060 BH398714CT 250 J Estimated concent ation below detection limit R Present in laboratory blank	030	BH398712UC				
J Estimated concent ation below d	030	BH398714CT				
B Present in laboratory blank	-	beted concent etion below	τ			
	. 2	ated concent attor blank	,			

₹¥

TABLE 4 3
SEMIVOLATILE ORGANICS IN SOILS
POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION
(ug/kg)

20 00 00 00 00 00 00 00 00 00 00 00 00 0	10.0000 10.0	RFW Batch ID	Field Sample Number	N Nitrosodiphenylamine	Dı n octylphthalate	D n butylphthalate	Bis(2 ethylhexyl)phthalate
100 0000 100 0000	100 000 000 000 000 000 000 000 000 00	030	BH398717BR				250 J
100 000	100 100	0 0 0 0 0	BH398719DH		•		210 J
1800 1814-1887	180 181	030					
10.00 11.0	10.00	030	BH398707DH			1	
100 110 114 114 115	100 11 11 11 11 11 11 1	200	BH408704UC	1			792 T
14 15 16 16 16 17 17 18 18 18 18 18 18	14 15 16 16 16 17 17 17 17 17	030	BH408707CT	1		ı	160 J
100 100	14.00 18.0	030	BH408709BR	•	1	ı	200 J
Name	Note House	*					
10010 1001	10010 1001	041	BI.ANK			1 09	
100 100	100 100	041	RH418712UC		•	2	
100.00 High 18717RR 150.00 150.00 High 18717RR 150.00	100.00 1	041	BH418714CT		i	ł	150 1
1000 1000	1000 1000	041	BH418717BR			ı	2001
100 100	100 0.050	041	B441870012	ı			2001
10 0050 H4187012D HS 10 10 10 10 10 10 10 1	10 0.050 BH4187012D HS P. 2.00	041	BH4187012D	1			150 1
ttch 8708 044 *** 011 0001BI BIJANK	110 0001Bl BLANK	041	BH4187012D MS			t	
10 000 BI BLANK	011 0001B1 BLANK	Batch	<u>*</u>				
044 0010	044 0010 BH428717MT	011	BLANK	•		70 1	. 64
tr h 8708 047 ** H42870009 044 0030	041 0200	044	PM428717WT				C 2+
044 0030 Hi4287009D 047 0001BL. BIAANK 047 0001BL. BIAANK 047 0001BL. BIAANK 048 0020 HI428732BR 100 J 34 J	044 0030 Hi4287009D tt h 8708 047 ** tt h 8708 047 ** 1047 0010BL. BHAZ8727RR 1040 010 Hi428722RR 1040 0040 Hi428723RS 1040 0040 Hi428732RS 1050 Hi428732RS 1060 Hi428737RS 1070 1	5	BH42870009			ı	140 5
1t h 8708 047 *** 1d 0010	National Color Hard Residual Color Har	044	BH4287009D				170 J
047 0001BL BLANK 047 00010 BH428727BR 048 0020MS BH428729BH MS 047 0020MS BH428729BH MS 047 0030 BH428734FS 100 J - 34 J MS 047 0030 BH428737FS 100 J - 34 J J MS 047 0030 BH428737FS 100 J - 39 J J J MS 047 0050 BH428737FS - 100 J - 130 J J MS 047 0130 BH428724BH - 170 J J J J MS 048 0001BL BLANK 049 0001BL BH428739FS 34 J MS 049 0001BL BH428739FS 34 J MS 040 001BLEst mate@lankCentration below detection limit of 330 ug/kg) 040 040 040 040 mainlyzed 040 040 040 040 mainlyzed 040 040 040 040 mainlyzed	047 0001BL BIANK 047 0010 BH428727BR 94 94 94 96 001BL BH428739FS 96 96 96 96 96 96 96 96 96 96 96 96 96		*				
047 0010 BH428727RR 34 J 34 J 34 J 35 J 35 J 34 J 35 J 35 J	047 0010 BH42872RR 34 J 010 00200KS BH428729DH KS 047 00200KS BH42873ER	047	BLANK				200 J
U1 U020	10020 BH428729BH BH28729BH BH28729BH BH28729BH BH28732BH BH28732BH BH28732BH BH28732BH BH28733FB BH428733FB BH428737BF BH428732BF BH428739FS BH4	047	BH428727BR				480
047 0020MS BH428729DH MS 34 JNS	047 0020Ms BH428729DH MS 34 JNS 047 0030 BH428732FS - - 047 0040 BH428737FS 100 J - - 047 0040 BH428737FS - 34 J - 047 0060 BH428724FH - 39 J - 047 0130 BH428724FH - 170 J - 047 0130 BH428724FH - 39 J - 047 0130 BH428724FH - 170 J - 048 001BL BH428739FS - 34 J - 049 0010 BH428739FS 34 J - - 049 0010 BH428739FS - - - - - - - - - - - - - - - - <td>-</td> <td>BH428729DH</td> <td></td> <td></td> <td>34 J</td> <td>720</td>	-	BH428729DH			34 J	720
047 0030 BH428732FS	047 0030 BH42873ES	047	BH428729DH MS			34 .NS	SN 065
047 0040 BH428734FS 100 J 34 J	047 0040 BH428734FS 100 J 34 J 34 J 34 J 60 M 20	047	Bi1428732FS		•) ; •	640
047 0050 BH42873FS	047 0050 BH428737FS 39 J 047 0060 BH428724DH 170 J 047 0130 BH428724CF - 170 J 049 0001BL BLANK 049 0010 BH428739FS 34 J	047	BH428734FS	100 J		34 J	410
047 0060 BH428722CT - 170 J atch 8708 049 ** 049 0001BL BLANK 049 0001BL BH42873FS 34 J atch 8708 053 ** Not detected (detection limit of 330 ug/kg) Not detected (detection limit of 330 ug/kg) Not detected (detection limit of 330 ug/kg)	047 0060 BH428722CT - 170 J 047 0130 BH428722CT - 170 J atch 8708 049 ** 14ch 8708 053 ** 14th 8708	047	BH428737FS			1	520
atch 8708 049 ** 049 0001BL BLANK 049 0001 BH428739FS 34 J 34 J 3553 00018LEst mateRialWicentration below detection limit of 330 ug/kg) Not detected (detection limit of 330 ug/kg) Not analyzed	atch 8708 049 ** 049 0001BL BLANK 049 0001BL BH428739FS 34 J 34 J 36 30 0018Let mateBlankCentration below detection limit of 330 ug/kg) Not detected (detection limit of 330 ug/kg) Not spiked Not spiked	047	PH428724TH			30 1	020
34 J	34 J	047	H428722CT		ı	170 J	200
34 J	34 J		*				
34 J	34 J	8708 049 0001BL	BLANK				1 000
		8708 049 0010	BH428739FS			34 J	610
			*				
		UZAU-059 0001BILS+	and the form the feet of the feet	1			1
		Beuggos Containest I B Prese	matemicancentration below ent in laboratory blank detected (detection limit	detection fimit of 330 ug/kg)			70 J
			analyzed	à			

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TABLE 4-3 SEMIVOLATILE ORGANICS IN SOILS POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION (ug/kg)

RFW Batch 1D	Feld Sample Number	N-Nitrosodiphenylamine	Dı n-octylphthalate	Dı n-butylphthalate	Bis(2 ethylhexyl)phthalate
8708 053 0010 8708 053 0010MS	BH428745DH BH428745DH NS	1 1		1	160 J 390 NS
** Batch 8709 002 **					
8709 002 0001BL 8709 002 0010	BLANK BH45870009 BH45870017	33 J			190 J 880 770
	BH45870917 NS	39 JNS			1200 NS
** Batch 8709 007 **					
8709 007 0001BL 8709 007 0010 8709 007 0020 8709 007 0020MS 8709 007 0030 8709 007 0040 8709 007 0060 8709 007 0060	BLANK BH458717UC BH458720CT BH458720CT BH458722BR BH458722BR BH458722BR BH458722BR		•		56 J 180 J 180 J 200 JNS 120 J 190 J 130 J
** Batch 8709 011 **					
8709 011 0001BL 8709 011 0010 8709 011 0020	BLANK BH458732FS BH458735FS				56 J 220 J 140 J
Bat h 8709 018 **					
8709 018 0001BL 8709 018 0010 8709 018 0020	BLANK BH46870009 BH46870919	1			73 J 250 J 210 J
** Eat h 8709 023 **					
8709 023 0001BL 8709 023 0010 8709 023-0020 8709 023 0020MS	BLANK BH468726CT BH468729BR BH468729BR MS		ı		73 J 230 J 350 410 NS
** Bat h 8709 027 **					
8709 027 0001BI	BLANK				73 J
Note J Est mated coa B Present in La Not detected NA Not analyzed NS Not spiked	Est mated concentration below detection limit Present in laboratory blank Not detected (detection limit of 330 ug/kg) Not analyzed Not spiked	detection limit of 330 ug/kg)			

903 PAD MOUND AND EAST TRENCHES AREAS REMEDIAL INVESTIGATION REPORT ROCKY FLATS PLANT GOLDEN COLORADO DRAFT DECEMBER 31 1987

at the desiration

TABLE 4 3
SEMIVOLATILE ORGANICS IN SOILS
POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION
(ug/kg)

		•			market from the	
March Marc		2002667110				464
Column C	170	M14.397.00F.S				420
Color Colo	200	DITTO COLLEGE		1	ı	900
027 0050 H4436172H 930 028 0010 H443672H + 95 JB - 930 028 0010 H443672H + 95 JB - 930 028 0010 H44672H + 95 JB - 930 028 0010 H44672H + 95 JB - 930 028 0010 H44672H + 93 JB - 930 038 0010 H447870H + 930 JB - 930 039 JB - 930 JB - 930 039 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 JB - 930 030 JB - 930 JB - 930 JB - 930 JB - 930 030 JB - 930 030 JB - 930 JB - 930	170	EH438/04LH	•		•	450
2027 0050 BHA38714RH	170	HH438/12DH	ı			210
12.00	027	BH438714DH	1		•	360
12 12 12 13 13 13 13 13	027	BH438717DH		1		430
14.0 17.0 18.4 18.5	027	BH438709DH	ı			630
Main		1				
Mail		**				
10.0.0 BH43872CTC 37 JB 38 JB 310 30 JB 310	034	BH438722DH	ı		43 JB	350 B
1,000	63	BH438725UC			38 JB	410 B
140 140	034	BH438727CT	37 JB			310 JB
140 140	0 34	BH438730BR			•	290 JB
tch 8709 038 *** 138 04001BL BLANK 95 J - 64 J 190 038 04010 BH448714BH - 40 JB - 64 J 190 038 0400 BH448714BH - 98 JB - 64 J 300 038 0400 BH44872BH 36 JB - 64 JB 300 038 0400 BH44872BH 36 JB - 64 JB 300 038 0400 BH44872BH 36 JB 38 JB 39 JB 43 JB 300 038 0400 BH44872BH 36 JB 36 JB 37 JB	034	BH438730BR MS				300 JNS
Name		**				
1900 1900	,					
1900 1900	200	BLANK BHAAQTOAN	. 65 H			190 J
Mark	3	M14407041M	dc 04	ı		300 38
March Mark	300	DN446/14DR	1 0C			370 B
Name of the content	000	13440/13UH	38 JB			300 B
0.38 0050 HH448724HH 34.0 0.38 0050 HH448722HH 34.0 0.38 0070 HH448732HK 38.0 38.0 0.38 0070 HH448732HK 34.0 38.0 0.4 0.1 HH438730D 34.0 34.0 0.5 0010 HH478706S 44.0 33.0 0.5 0010 HH478706S 44.0 33.0 0.5 0010 HH478706H 34.0 33.0 0.5 0010 HH478706H 36.0 33.0 0.5 010 HH478706H 36.0 36.0 0.5 013 HH478706H 36.0 36.0 0.5 014 HH478706H 36.0 36.0 0.5 015 HH478706H 36.0 36.0 <td>860</td> <td>EH448722DH</td> <td>36 JB</td> <td></td> <td></td> <td>380 B</td>	860	EH448722DH	36 JB			380 B
0.38 0060 BH448729MT 38 JB 430 0.38 0060 BH448729MT 38 JB 430 0.38 0150 BH448730M 34 JB 730 0.4 150 BH448730M 48 JB 730 0.52 0001bl. BH47870BS 48 JB 52 JB 52 JB 0.52 0001bl. BH47870BS 41 JB 52 JB 52 JB 52 JB 0.52 0001bl. BH47870BH 38 JB 44 JB 52 JB	038	BH448724DH				340 B
038 0070 BH48F32BH 038 0070 BH48F32BH 048 0150 BH48F32BH 052 0001BL BLANK 9/18 140 J 052 0001BL BH478F00FS 48 JB 552 JB 550 JB 750 O52 0000 BH478F00FS 39 JB 760 JB 1478F00FH S 141 JB 14	038	BH448729WT				430 B
tr h 8709 0 2 *** 34 JB 730 tr h 8709 0 2 ** 44 J 330 052 0001BL BHA78700FS 48 JB 44 J 52 JB 58 JB 052 0010 BH478702FS 41 JB 48 JB 52 JB 58 JB 58 JB 760 052 0010 BH478702FB 41 JB 38 JB 44 JB 890 760 052 0070 BH478706BH 37 JB 38 JB 760 44 JB 890 052 0070 BH478706BH 37 JB 38 JB 44 JB 890 052 010 BH47870BH 36 JB 36 JB 36 JB 790 052 010 BH47871JH 36 JB 37 JB 1000 052 0170 BH538702H 38 JB 33 JB 33 JB 1300 052 0170 BH538702H 33 Ug/kg) 33 JB 33 JB 33 JB 1300 s J St Limated concentration limit of 330 ug/kg) <t< td=""><td>038</td><td>PH448732BR</td><td></td><td></td><td></td><td>920 B</td></t<>	038	PH448732BR				920 B
1t h 8709 0 2 ** 1t h 8709 0 2 ** 1t h 8709 0 2 ** 1t h 140 J 44 J 330 J 1c c 0001bl. BHANK 9/18 140 J 48 JB 52 JB 760 JB 47 JB 760 JB	0 38	EH4387300D				730 B
052 0001BL BILANK 9/18 140 J 44 J 33 B 52 JB 580	8709 0					
652 0010 BH478700FS 48 JB 562 JB 58 JB 580 652 0010 BH478702FS 41 JB 48 JB 48 JB 52 JB 52 JB 52 JB 58 JB 58 JB 48 JB 920 652 0050 BH478704JH 37 JB 37 JB 750	052	BLANK 9/18	140 .1		44 .1	330
52 0.05 BH478702N3 41 JB 50 JB 052 0.05 BH478702N3 41 JB 47 JB 47 JB 760 052 0.07 BH478704JH 37 JB 760 39 JB 760 052 0.07 BH478706JH 89 760 44 JB 89 052 0.09 BH478706JH 89 78 89 052 0.10 BH478713JH 36 JB 36 JB 100 052 0.17 BH53870CJH 38 JB 100 052 0.17 BH53870CJH 38 JB 130 052 0.19 BH53870CJH 38 JB 130 05 0.10 BH53870CJH 30 JB 130	052	BH478700FS	48 .13			580 B
652 0050 BH478704DH 38 JB 760 052 0070 BH478704DH 37 JB 750 052 0070 BH478706DH BH478706DH 89 JB 750 052 0070 BH478706DH BH478706DH 890 630 052 0100 BH478710DH 36 JB 790 052 0110 BH478713DH 36 JB 1000 052 0120 BH538700DH 36 JB 1200 052 0170 BH538702DH 38 JB 1300 052 0170 BH538702DH 38 JB 1300 052 0170 BH538702DH 38 JB 1300 054 0190 BH538702DH 38 JB 1300 1 B Pre ent n laboratory blank Not detected (detection limit of 330 ug/kg) Not detected (detection limit of 330 ug/kg)	052	PH478702FS	41. IB			420 B
Statement Stat	95	PH478704DH	38 38			3 020 3 030
052 0070MS BH478706DH MS 630 052 0050 BH478708DH MS 630 052 0100 BH478709DH 630 052 0110 BH478713DH 630 052 0110 BH478713DH 652 0110 BH478713DH 630 052 0110 BH478713DH 630 052 0110 BH478713DH 652 0110 BH538700DH 38 JB 730 052 0110 BH538702DH 38 JB 730 052 0110 BH538702DH 38 JB 730 054 0190 BH538702DH 64eection limit S J Estimated concentration below detection limit B Fire ent n laboratory blank Not detected (detection limit of 330 ug/kg) NA Not analyzed	36	181478706DH	37 E			750 B
052 0090 BH478708Nii 052 0100 BH478708Nii 052 0110 BH47871DH 052 0120 BH47871DH 052 0130 BH47871DH 052 0170 BH538700Ni 36 JB 052 0170 BH538702DH 054 0190 BH538702DH 055 0190 BH538702DH 055 0190 BH538702DH 056 0190 BH538702DH 057 0190 BH538702DH 058 0190 BH538702DH 059 0190 BH538702DH 050 0190 BH538702DH 0	3		3			1 E C C C C C C C C C C C C C C C C C C
Section Sect	053					630 B
State Stat	3	BH4787090H				790 B
State Stat	05.0	PH478711N4				a 086
1200 1200	3 6	BH4787131N				
95.2 0190 BH538702DH 38 JB 33 JB 1300 05.2 0190 BH538702DH 38 JB 1300 1300 BF ent n laboratory blank Not detected (detection limit of 330 ug/kg) NA Not analyzed	05.5	MOOTES SHE	36 13			
s J Estimated concentration below detection limit B Fre ent n laboratory blank Not detected (detection limit of 330 ug/kg) NA Not analyzed	700	Diographic Property	30 30		!	
s A N	052	BH538702DH	38 JB		33 JB	
9 8 W	·-	timated concentration below	detection limit			
Not detected (detection limit Not analyzed	n -	timated concentration below	THE TOTAL THE P			
Not analyzed		ent in importatory blank				
		c derected (detection limit				
		0000				

903 PAD MOUND AND EAST TRENCHES AREAS REMEDIAL INVESTIGATION REPORT ROCKY FLATS PLANT GOLDEN COLORADO DRAFT **DECEMBER 31 1987**

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TABLE 4 3
SEMIVOLATILE ORGANICS IN SOILS
POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION
(ug/kg)

ı					
8709 052 0220	BH538706DH		ı		930 B
052	BH538708DH	1	1	42 JB	1 et 0006
052	BH568717WF	,		er og	1100 B
052	BH568720CT			er og	8808
8709 052 0300	BH568722BR	42 JB	,	47 JB	1000 B
** Batch 8709 058 **	*				
K709 058 0001BI	BLANK 9/18	140 J		44 J	330
028	BLANK 9/21	35 J	,	43 J	550
028	BH478716FS			58 JB	900 B
058	BH478720DH	1	•	48 JB	
058	BH478721FS	36 JB	1	55 JB	
058	BH478722WT	120 JB	ı	260 JB	970 B
058	BH538714DH			87 JB	
058	ВН538716DH		ı	49 JB	720 B
8709 0 8 0110	BH538719WT			59 JB	700 B
8709 058 0120	BH538720CT			61 JB	810 B
8 03 0 8 0130	BH538722BR	ı	,	58 JB	670 B
* Batch 8709 061 **	<u>*</u>				
;					
_ :	BLANK 9/21	35 J		43 J	
9	BH478726CT			44 JB	810 B
č	BH4787026D				B 096
061	BH478727BR		•		1100 B
8709 061 0070	BH548702WT	250 JB	•		1200 B
8709 061 0090	BH558702DH		,		B 096
8709 061 0100	BH558710DH		,		1200 B
190	PH558712WT				1200 B
9.	RH55871424		•		a 060
9	PH5587271IC		ı	48 13	300
90	DHAROTOCT	160 rb	i		960
3 6	DIE 607000	100 38	ı	f S	800 B
3 5	30000000000000000000000000000000000000	•	,	96 S	H OOS
9			ı	49 JB	1000 B
8709 061 0160MS 8 09 061 0170	EH558732BED MS EH558734DH		•	50 JBNS 80 JB	850 BNS 890 B
* Bat h 8709 064 *	* *				
870) 064 0001BL 8709 064 0010	BLANK 9/23 BH548706DH	46 J	1	39 J 90 JB	340 610 B
,		•			
Note J Estin B Pese		below detection limit ank			
NA Not. 8	Not detected (detection limit Not analyzed	limit of 330 ug/kg)			

903 PAD MOUND AND EAST TRENCHES AREAS REMEDIAL INVESTIGATION REPORT ROCKY FLATS PLANT GOLDEN COLORADO DRAFT DECEMBER 31 1987

TABLE 4 3
SEMIVOLATILE ORGANICS IN SOILS
FOSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION
(ug/kg)

RFW Batch ID	Field Sample Number	N-Nitrosodiphenylamine	Di n-octylphthalate	Dı n-butylphthalate	Bis(2 ethylhexyl)phthalate
064	BH548708DH BH548710DH	56 J 37 J		50 JB 63 JB	330 B 640 B
8709 064 0040 8709 064 0040MS 8703 064 0090	BH548712DH BH548712DH MS BH48870006	34 JNS		42 JB 42 JB 42 JB	550 BNS 700 BNS 670 B
** Bat h 8709 065					
8709 065 0001BI 8709 065 0020	BLANK 9/23 BH488713CT	,		39 J 42 JB	340 470 B
065 065	BH488715BR BH508707FS			35 JB 49 JB	560 B 610 B
8709 065 0080 8709 065 0090 8709 065 0100	BH508712UC BH508715CT BH508717BR		•	36 JB 56 JB 35 JB	450 B 690 B 370 B
t h					
8709 063 0001BL	BLANK			39 J	340
690	BH49870008	J. 8.4.		85 03 85 03	600 B
8709 OF9 0020 8709 OF9 0050	BH49870816 BH54871424	41 J 62 J		68 JB 46 JB	360 B
069	BH51870009	52 J		120 JB	460 B
** Batch 8709 (8709 075 **				
075	BLANK 9/28	52 J		330	240 J
8709 075 0010	BH548738WT PH548740CT	84 JB		36 JB 55 JB	
075	BH548742BR				500 B
075	BH5487042D		1	34 JB	650 B
8709 075 0050	BH54872334 pu40092001C		,		710 B
075	BH498722CT				720 B
8709 075 0130	B1498724BR	•			
** Hat h 8709	8709 078 **				
8709 078 0001BL	BLANK 9/28	52 J		330 72 JB	240 J 510 B
078	BH518714CT BH518717BR			70 JB 86 JB	620 B 720 B
2					
Notes J B	Estimated concentration below detection limit Present in laboratory blank	w detection limit			
	Not detected (detection limit Not analyzed	t of 330 ug/kg)			
£	Not sp Ked				

903 PAD MOUND AND EAST TRENCHES AREAS REMEDIAL INVESTIGATION REPORT ROCKY FLATS PLANT GOLDEN COLORADO DRAFT DECEMBER 31 1987

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TABLE 4-3
SEMIVOLATILE ORGANICS IN SOILS
POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION
(ug/kg)

hthalate

Kuw Hat n IV	Field Sample Number	ATTENDED TREETS TRAINED			
078	BH518717BR MS	130 JBNS		51 JBNS	810 BNS
	BH52870010	370 B		120 JB	630 B
8709 078 0080	BH528712DH	210 JB	1	67 JB	650 B
8709 078 0090	BH528722CT	140 JB	•	39 JB	80 B
8709-078 0100	BH528724BR	280 JB	1	84 JB	530 B
** Batch 8710 016 **	**				
					1
8710 016 0001BL	BLANK 10/08	f 89 J	ı	•	360
8710 016-0010	BH598704UC	66 JB	•	•	1300 B
8710-016 0020	BH598707CT	56 JB	ı	1	1500 B
8710 016-0030 8710 016-0030MS	BH598709BR BH598709BR MS	- 56 JBNS	ı	į t	680 B 1000 BNS
** Batch 8710 025 **	**				
8710 025 0001BL	BLANK 10/26	1	i	ı	J. 77
	BH578704DH			1	250 JB
8710 025=0020	H45787080H	1. Oat	•		480 B
8710 025 0030	BH5787101C	2 1	ı	ı	300g
8710 025-0040	BH578712CF	45 J	1	1	250 JB

** Daten 0/10 032 **	•				
8710-032 0001BL	BLANK 10/26	ı	ı	ı	t 17
032	BH578714BR	77 J		ı	460 B
8710 032 0020	BH578716DH	36 J	1	1	200 B
8710 032-0030	BH578718DH	130 J	1	í	540 B
	BH578720DH	38 J		1	510 B
032	BH578722DH	140 J		ı	280 JB
8710 032 0060	BH578724DH	52 J	1	ı	830 B
032	BH578726DH	120 J	ı		1000 B
	BH578726DH MS	37 JNS	ı	ı	290 JBNS
032	BH578728DH	77 J	ı	ı	150 JB
032	BH588700UC	97 J		1	130 JB
8710 032 0100	BII588702CT	84 J	ı	f 09	85 JB
032	IM1588704BR	ı		650	160 JB
8710 032 0170	BH5787028D	52 J	ı	74 J	140 JB
** Batcl 8710 040 **	* *				
8710 040 0001BL	BLANK 10/26	ı	ı	•	J. 77
	Estimated concentration below	low detection limit			
B Pres	Present in laboratory blank	11 2 3 000 9			
	Not detected (detection limit of 330 ug/kg)	t of 330 ug/kg)			
NA Not	analyzed				

TABLE 4-3
SEMIVOLATILE ORGANICS IN SOILS
POSSIBLY ATTRIBUTABLE TO LABORATORY CONTAMINATION (ug/kg) Field Sample Number

N-Nitrosodiphenylamine

Di n-octylphthalate

Di-n butylphthalate

280

Bis(2-ethylhexyl)phthalat

8 120

Notes

₹ ₹

Estimated concentration below detection limit Present in laboratory blank
Not detected (detection limit of 330 ug/kg)
Not analyzed
Not spiked **ت** ھ

BH618707DH

8710 040 0010

RFW Bat 1 ID

detection limits and was present in one of the laboratory blanks nitrosodiphenylamine di n octyl phthalate and di n butyl phthalate were generally present only at estimated concentrations below detection limits and bis(2 ethylhexyl)phthalate appeared in many of the samples generally at estimated concentrations below detection limits or within a factor of 2 of the detection limit (330 ug/kg) and was present in several blanks. As mentioned the exceptions to those general rules are discussed subsequently under the SWMU subsections. However in general it appears that the presence of these compounds in the samples represent laboratory artifact Methylene chloride acetone and 2 butanone are common volatile solvents used in the laboratory N nitrosodiphenylamine is a degradation product of the gas chromatograph column Phthalates are components of plasticizers whose presence in a sample or blank can be generally attributed to contact with plastic With the exception of acetone and bis(2 ethylhexyl)phthalate the presence of these compounds in the soils is not expected based on the waste management history Records indicate an unknown number of drums stored at the 903 drum storage site contained acetone and vacuum pump oil Bis(2 ethylhexyl)phthalate is a component of vacuum pump oil (Sax and Lewis 1987)

Unlike HSL organics metals and radionuclide concentrations must be evaluated relative to background soil concentrations. Background for soil samples was based on 1986 sampling and analysis done in the west buffer zone (an area not affected by any waste disposal activities). Table 4.4 presents the background soil data. A one time sampling of a plot in the west buffer zone to a depth of one foot cannot be considered a complete characterization of background alluvial and bedrock materials however it suffices as a basis for assessing potential contamination.

903 PAD MOUND AND EAST TRENCHES AREAS REMEDIAL INVESTIGATION REPORT ROCKY FLATS PLANT GOLDEN COLORADO DRAFT DECEMBER 31 1987

TABLE 4 4

CONCENTRATIONS OF METALS AND RADIONUCLIDES
IN BACKGROUND SOIL

	Concentration
	PPM (mg/kg)
Metals	
A1	6540 9140
Sb	38 U 41 U
As	61 U 10 U
Ba	122 U 137 U
Be	30 U 34 U
Ca	1020 1960
Cd	30 U 34 U
Cr (Total)	56 13
Co `	12 U 25
Cu	66 11
Fe	9080 12 400
Pb	15 48
Mg	883 1490
Mn	196 337
Hg	01 U
N ₁	13 U 20
K	951 1860
Se	31 U 34 U
Ag	31 U 34 U
Na	63 U 217
Tl	63 U 68 U
Sn	25 U 27 U
\mathbf{v}	25 U 27 U 30 U 38
Zn	20 50
	Concentration
	(pC_1/gm)
Radionuclides	**
Pu	01(10) 10(20)
Am	02(03) 28(16)
U233+234	66(16) 14(20)
U238	62(17) 92(18)
Tritium	70(220) 280(270)

U indicates values less than detection limits

^{**} Parentheses indicate counting error

Tritium is in units of pCi/l of soil water

Radionuclides are analyzed by counting sub atomic particle emissions which is a random function Since radioactive disintegration is a statistical process and therefore has a probability distribution results are reported as a measured value with an associated two standard deviation propagated error term indicated in parentheses immediately following the measured value. In many cases a determination that two radionuclide concentrations are different from each other requires a statistical analysis incorporating the error term. A statistical analysis will be performed prior to preparation of the final RI report However even without performing a statistical analysis radionuclide concentrations where the error term is larger than the measured value can be considered not statistically different from background because of the significant overlap of the probability distributions. Also if the measured value for a radionuclide falls within the background measured value range it is also not considered to be above background levels regardless of the error term. This is the basis for stating in this report that a radionuclide concentration is not above background levels Similarly if the measured value minus the error term for a sample is greater than the measured value plus the error term for the upper limit of the background range it can be considered to be statistically different from background This leaves a range of measured values and error terms between these extremes where without a statistical analysis it cannot be definitely stated whether the radionuclide concentration in the sample is different from background discussed below uranium levels in some soil samples from the 903 Pad Mound and East Trenches are a case in point

Uranium concentrations in soil samples from the 903 Pad Mound and East Trenches Areas generally met the above criteria for being within background levels Table 45 shows those samples where uranium concentrations may be above

TABLE 4 5 URANIUM CONCENTRATIONS ABOVE ESTIMATED BACKGROUND LEVELS

	CONCENTRATION	(pC1/g)
SAMPLE NO.	<u>U 233+234</u>	<u>U 238</u>
BH25870009		1 1(0 3)
BH25870009D		1 5(0 3)
BH258718BR		1 4(0 3)
BH258720WS		1 4(0 3)
BH26870003		1 0(0 2)
BH268703CT		1 0(0 2)
BH288700WT		1 4(0 3)
BH288706CT	1 5(0 3)	1 4(0 3)
BH288709BR	2 8(0 5)	18(04)**
BH338716CT	1 5(0 2)	1 4(0 2)**
BH338720WT		1 1(0 2)
BH36870005		17(03)**
BH3687005D		1 2(0 3)
BH368720CT	1 6(0 4)	2 2(0 4)**
BH368723BR	• •	0 94(0 35)
BH378725BR		1 6(0 4)**
BH45870917		1 5(0 2)**

^{*} Background upper limits U 233+234 [1 4(0 2)] U 238 [0 92(0 18)] ** Likely to be statistically different from background

background levels Only six of the samples had uranium concentrations likely above background levels but even in these cases the concentrations were generally within a factor of two of the upper background concentrations. Considering 1) background concentrations for uranium are not well characterized 2) most soil samples had uranium concentrations within the estimated background limits and 3) only a few random samples had uranium concentrations that may be above the estimated background limits but are still within a factor of two it is concluded that uranium contamination of the soils at the 903 Pad Mound and East Trenches does not exist and the observed uranium concentrations likely represent natural variation of uranium in the soils. Such is not the case for plutonium and americium where in some samples their concentrations are significantly elevated above background. These observations are discussed in the SWMU subsections.

In general metal concentrations in soil samples from the 903 Pad Mound and East Trenches Areas were within the background levels shown in Table 4.4 Metals of interest from a public health perspective and their respective concentrations that exceeded the upper limit of the background range are shown in Table 4.6 (Metals analyzed for but excluded from this analysis are aluminum iron and manganese). Inspection of the data shows that generally these metal concentrations are within a factor of two of background. The following samples had metal concentrations in excess of three times background.

TABLE 4 6

METAL CONCENTRATIONS IN SOILS ABOVE ESTINGTED BACKGROUND LEVELS

Sample No	As (100)	8a (137U)	cd (3.4U)	Cr (13)	Cu (11)	#8 (10)	N I (20)	SR (3 4U)	(38)	Zn (50)
BH22870009 BH22870009D BH22871018 BH228720CT	13 6			.	12	6		3 3 4 4 3 5 4 4 3 5 4 4 3 5 5 4 4 3 5 5 4 4 3 5 6 4 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1 4 1		
8H23870008 BH23870008D BH238708CT BH2387118R		212	eo Y M	18 22	112	19 10 21	22	14,3	40	
8H24870002 BH248708BR BH248710WS	.				.			5 3 16J 100		63
BH25870009 BH25870009D BH258709WT BH25870910 BH258716CT BH258718BR	15 7	1899	4 10 10 4 80 4 10 10 4 80	20 21 1 20 1 13 1	W.	12	2 2 3 6 4 2 4 2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	29 16 7 30 7 50 1	7 7 7 7 7 7	45 60
8426870003 BH268703CT BH268706BR BH27870010 BH278710CT	1 1 1 0 8 8 8	216	n 4	5 5 1 1 1 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5	0 8 4 4 4 8 8 9	!		87 6 100 34 12 2J	39	

All concentrations (mg/kg) Antimony beryllium selenium thallium and tin concentrations never exceeded background Parentheses indicate upper limit of background concentration

	Ħ	METAL CONCENTRATIONS	=	SOILS ABOVE ESTINATED (Continued)	VE ESTIN nued)		BACKGROUND LEVELS	VELS*		
Sample No	As (10U)	Ba (137U)	cd (3 40)	Cr (13)	Cu (11)	на (10)	N 1	SR (3 4U)	(38)	2n (50)
BH288700WT BH288705WS BH288706CT		150	~ ~ M					171	64	
BH288709BR						12		77		
BH29870010 BH298713CT						11		17.1		
BH298716BR BH298717WT						6 0		38	67	
BH31870013	12							92		
BH31870013D								34		
BH318713CT BH318716BR	4							5 6 2 6 2 6		
BH32870008						13		30		
BH32870815						34		191		
BH328718BR BH3287815D						12	23	16J 13J		
BH33870004	- -		3 7					54		
BH33870815	15							23		
BH338716CT								16J		
BH338720WT	15							32	£ 7	
BH3387815D								121	94	
8134870008								58		
BH348708CL	,							<20		
BH348715WS BH348718CT	12				25				108	
BH3487218R BH3487815D	13							20		

All concentrations (mg/kg) Antimony beryllium selenium thaliium and tin concentrations never exceeded background Parentheses indicate upper limit of background concentration

	MET	TAL COUCENTRATIONS	=	SOILS ABOVE ESTIMATED (Continued)	VE ESTIN		BACKGROUND LE	LEVELS		
6	As	Ba	P3 27	6.7	00 (11)	B C	N I	SR	> K	
	(00)	78751	1		711			1	725	
BH35870012	13							43		
BH35870012D	10							20		
BH35871215								36		
BH358715CT				14	16		21	36	67	
BH358718BR	14	142		15	18			0 7	07	
BH36870005								120		
BH3687005D		140						20		
BH368705WS								87		
BH36870515				14				191		
BH368720CT				18				16J		
BH368723BR					17			94		
8137870005								65		
BH3787005D								184		
8H378705WS								51		
BH37871113								32		
BH378721CT								30		
BH378725BR	20	390					22	38		
BH38870010								36		
BH388720BR								99		
8H398700FS	3.7		5 7					191		
BH398702DH	26		6 2					23		
BH398704DH								09		
BH398707DH	12			16	13			22		
BH398709FS	12									
BH398712UC	17									
BH398714CT	25	413			13			22	59	
8H398717BR								22		
BH398719DH			0 4					20		

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TABLE 4

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All concentrations (mg/kg) Antimony beryllium selenium thallium and tin concentrations never exceeded background Parentheses indicate upper limit of background concentration

903 PAD MOUND AND EAST TRENCHES AREAS REMEDIAL INVESTIGATION REPORT ROCKY FLATS PLANT GOLDEN COLORADO DRAFT DECEMBER 31 1987

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	H 84	METAL CONCENTI	CENTRATIONS IN S	Cr Cut	VE ESTIN nued) Cu	SOILS ABOVE ESTIMATED BACKGROUND LEVELS (Continued) Cr Cu Hg NI	GROUND LE	VELS*	> ;	Z n
Sample No	(100)	(1370)	(3.40)	(13)	(11)	(.10)	(20)	(3 40)	(38)	(50)
BH408704UC	15							28		
BH408707CT BH408709BR								151		
BH41870012	12			32				56		
BH4187012D	14							2.5		
BH418712UC	12							18. 1.		
BH418714CT	M M							0 88		
BH4:0/:/BK	2									
BH42870009	15							24		
BH4287009D	14							9 7		
BH428717WT	18							<20		
BH428722CT	10							147		
BH428724DH								191		
BH428727BR		174			,			27		
H428729D		397		13	15			24		
BH428732FS								171		
BH428734FS								~20		
BH428737FS								<20		
BH428739FS								<20		
84428745DH								<20		
BH438700FS								<20		
BH438702FS								53		
BH438704DH								27		
BH438709DH								<20	22	
BH438712DH								<20		
BH438714DH				58				<20		
BH438717DH								<20		
BH438722DH				34				<20		
BH438725UC				54				<20		
84438727CT		170			13			<20	4.1	;
BH438730BR			9 %		17			32		0 9
BH4387300D					<u>*</u>			6		

All concentrations (mg/kg) Antimony beryllium selenium thallium and tin concentrations never exceeded background Parentheses indicate upper limit of background concentration

903 PAD MOUND AND EAST TRENCHES AREAS REMEDIAL INVESTIGATION REPORT **DECEMBER 31 1987** DRAFT

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TABLE 4

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	. BE	NETAL CONCENTI	MCENTRATIONS IN S	OILS ABOVE ES (Continued)	VE ESTIN nued)	SOILS ABOVE ESTINATED DACKGROUND LEVELS (Continued)	ROUND LE	VELS		
Sample No	As (10U)	Ba (137U)	cd (3 4U)	Cr (13)	Cu (11)	Hg (10)	N I (20)	SR (3 4U)	(38)	2n (50)
BH448704DH								<20		
BH448714DH								<20		
84448719DH								<20		
BH448722DH								<20		
BH448724DH								<20 2.0		
BH448729UT					;			<20 21		
BH448/32BR					7			54		
8145870009								84		
BH45870917	11							15.1		
BH458717UC	14		1 4					181		
BH458720CT								151		
BH4587228R								2.7		
BH458725FS			9 M					32		
BH4587270H	13	226			17		23	41	09	9
BH458730DH	14	139	4 5		13			56		
BH468726CT		151 4	6 2					26	51	124
BH468729BR								15.1		
BH478700FS								32		
BH478702FS	10 5							62		
BH4787026D							22 3	<20		
BH478704DH	11 7							42		
BH478706DH				19				55		
BH478708DH				8						
BH478709DH BH478711DH				.				20		
BH478713DH								<20		
BH478716FS								<20		

All concentrations (mg/kg) Antimony beryllium selenium thallium and tin concentrations never exceeded background Parentheses indicate upper limit of background concentration

	2	NETAL CONCENTI	CENTRATIONS IN S	OILS ABOVE ES (Continued)	VE ESTIN nued)	SOILS ABOVE ESTINATED BACKGROUND LEVELS (Continued)	GROUND LE	VELS*		
Sample No	As (100)	8a (137U)	Cd (3, 4U)	Cr (13)	6u (11)	на (10)	N 1 (20)	SR (3 4U)	(38)	2n (50)
147873H				ž				001		
8H478721FC				0 a				220		
BH478722UT				9				×20		
BH478726CT							26 8	33 7		
84478727BR							29 8	7 77		52
BH48870006								76 8		
BH488713CT	12 3									
BH488715BR						12		9 62		
BH49870008			15.2			30	25 5	<20		
BH49870816				18 2			,	<20		
BH498720UC								<20		
BH498722CT						13				
BH498724BR										9 22
BH508707FS						12		27 2		
BH508712UC					13 1	12		<20		
BH508715CT	10 8				111	22		28 7		
BH5087178R						29		<20		
BH51870009				20 6				27		
8						14		<20		
BH518714CT						17		<20		
2						12		<20		
BH52870010						5		170		
BH528712DH						23		<20		
BH528722CT										
8#52872488						12		54 9		28

TABLE 4

All concentrations (mg/kg) Antimony beryllium selenium thallium and tin concentrations never exceeded background Parentheses indicate upper limit of background concentration

	LEVELS*	SR V Zn (3.4U) (38) (50)	59 <20 <20 <20 21 7	196 45 6 39 2 <20 <20 <20 <20 <20 <20 <20 <2	163 56 16J <20
	ESTIMATED BACKGROUND LEVELS:d)	Hg N1			
9 7	ESTINATED (ed)	Cu H			12
TABLE	SOILS ABOVE ES (Continued)	cr (13)		7-	23 14 18
	CENTRATIONS IN	cd (3.4U)		eo m	
	00	Ва (137U)	140	154	
	METAL	As (10U)		29 6 10 7 12 5 12 7 12 8	
		Sample No	1 0	84548702WT 845487042D 84548706DH 84548708DH 84548712DH 84548712DH 8454872334 845487234 84558702DH 84558712WT 84558712WT 84558712WT 84558712WT 84558712WT 84558712WT 84558712WT	BH568702DH BH568704FS BH568709DH BH568712DH

All concentrations (mg/kg) Antimony beryllium selenium thallium and tin concentrations never exceeded background Parentheses indicate upper limit of background concentration

<u>Metal</u>	Background Concentration (mg/kg)	Sample Concentration (mg/kg)	Sample No.
Arsenic	10U*	37	BH398700FS
Barium	137U	1899	BH2587009D
Cadmium	3 4U	152	BH49870008
Chromium	13	58	BH438714DH
Mercury	0 1U	0 34	BH32870815

U indicates metal not detected at detection limit shown e.g. 10 mg/kg is the reported detection limit for arsenic

With the exception of barium at 1899 mg/kg the above metal concentrations only slightly exceeded three times the upper limit of the background levels. The reason for the high barium concentration is not known but little significance can be placed on this isolated occurrence. Because background metal concentrations are not well characterized and most metal concentrations in the soil samples are at or within a factor of two of background levels, it is concluded that metal contamination of the soils of the 903 Pad Mound and East Trenches does not exist and the observed metal concentrations likely represent natural variations of metals in the soils

41 903 PAD AREA

As discussed in Section 2 the 903 Pad Area was used mainly for disposal of flattened depleted uranium and plutonium contaminated drums. There are five solid waste management units (SWMUs) located within the 903 Pad Area. Presented below are the waste characterizations of each of these SWMUs. Soils of the gas detoxification site (SWMU 183) were not investigated as it is a RCRA regulated unit and site investigations will be performed in accordance with the Part 265 Closure. Plan. The reader is directed to the introduction for a description of the waste management practices at each SWMU. For the 903 drum storage site and 903 lip site.

the discussion is repeated here because of its particular significance in evaluating the data collected for these sites

Solid Waste Management Units 112 903 Drum Storage Site and 155 903 Lip Site

These SWMUs are located south of Central Avenue just inside the East Guard Gate. The 903 drum storage site was used from 1958 to 1967 to store drums containing radioactively contaminated used machine cutting oil. Up to 5 240 drums were stored at this site during its use

Approximately 3 570 drums contained oils and solvents contaminated with plutonium and the balance were contaminated with uranium. Most of the drums contained lathe coolant consisting of mineral oil and CCl₄ in varying proportions. However an unknown number of drums contained hydraulic oils vacuum pump oils. TCE PCE silicone oils and acetone (Rockwell International 1986a). Ethanolamine was also added to new drums after 1959 to reduce the drum corrosion rate.

Removal of the drums from the storage area began in 1967. The older drums and those containing plutonium were removed first. The last known drum of contaminated liquid was removed in June 1968.

After the drums were removed efforts were undertaken to scrape and move the plutonium contaminated soil into a relatively small area cover it with fill material and top it with an asphalt containment cover (903 Pad). This remedial action was completed in November 1969. An estimated 5 000 gallons of liquid leaked into the soil during use of the drum storage site. The liquid was estimated to contain 86 grams of plutonium (Rockwell International 1986a).

During drum removal and cleanup activities associated with the 903 drum storage site winds redistributed plutonium beyond the pad to the south and east Approximately 10 Curie (Ci) of plutonium was deposited between the pad and the perimeter security fence. The most contaminated area is immediately adjacent to the pad to the south and southeast. Partial cleanup of this area referred to as the 903 lip site occurred in 1978 when about 47 million pounds (lbs) of contaminated soil containing 0.56 Ci plutonium were removed packaged and shipped off site as radioactive waste (Rockwell International 1986a). Soil was removed from the area until contamination levels were below the detection limits (250 dpm) of the radiometric survey instrument (FIDLER). This implies plutonium concentrations as high as 10 ug/m² [60 picoCuries per gram (pCi/g) assuming a 1 cm depth and a soil density of 1 g/cm³] may still remain in the surface soil. However, these surface soils at the excavated area were backfilled to grade with clean topsoil to a depth of 15 to 20 cm and reseeded with native grasses (Barker and others 1982)

Several boreholes were drilled to characterize the soils in the vicinity of the 903 drum storage (pad) and lip sites. Borehole BH29 87 was drilled approximately 200 feet west of the pad area. Boreholes BH22 87 and BH23 87 were placed in the 903 lip site approximately 50 feet south of the southwest and southeast quarters of the 903 pad respectively. Borehole BH24 87 was drilled about 200 feet southeast of the southeast corner of the pad and borehole BH30 87 was located approximately 200 feet east of the pad. Both boreholes BH24 87 and BH30 87 are in the lip site. Based on the historical waste management practices at these SWMUs plutonium CCl₄ TCE PCE and possibly acetone and bis(2 ethylhexyl)phthalate are the contaminants expected at this location.

Soil gas sampling indicated the presence of the volatile organic compounds TCE PCE and CCl₄ in the vicinity of the 903 drum storage and lip sites PCE was present at high levels (>10 000 counts) while TCE and CCl₄ ranged from low levels (<1 000 counts) south of the 903 drum storage site (lip site) to moderate levels (1 000 10 000 counts) to the east of the 903 drum storage site (northeastern portion of the lip site) at moderate to elevated levels. No other organic compounds were detected in the soil gas samples

As discussed in the introduction to Section 4 analytical results from soil sampling of these boreholes indicate the presence of HSL organics but it appears that these organics may have originated from the laboratory. However, it is noted that of the lab contaminant organics bis(2 ethylhexyl)phthalate was significantly elevated in some samples relative to that seen in the blanks. It ranged from 1200 3300 micrograms per kilogram (ug/kg) in boreholes BH30 87 (all samples below 10 feet). BH23 87 (all samples) and BH24 87 (2 and 10 foot samples). It occurred at 8100 ug/kg in BH30 87 (10 foot sample) and 18 000 ug/kg in BH29 87 (16 foot bedrock sample). Also of note di n butyl phthalate was present at 3 400 ug/kg in BH30 87 (10 foot sample). The occurrence of bis(2 ethylhexyl)phthalate at high concentrations at depth may indicate a release of this organic to ground water at the 903 drum storage site. Bis(2 ethylhexyl)phthalate is a component of vacuum pump oil a waste stored at the 903 drum storage site.

Of the HSL organics that represent industrial solvents toluene occurred only in the 0.2 foot sample from BH24 87 (1.7 J ug/kg) however it was also detected in the laboratory blank from the same sample at 2 ug/kg. Trichloroethane (1.1.1 TCA) was detected in the 0.10 foot sample (BH29 87) at 5 J ug/kg. These sporadic and low concentrations of solvents indicate solvent contamination of the soils in this area is

not extensive and possibly non existent. The TCE PCE and CCl₄ detected in the soil gas is present in the ground water as indicated by data for wells 1.71 and 2.71

Plutonium and americium were the radionuclides found above background levels in the vicinity of the 903 drum storage site. Plutonium as expected considering the waste storage history at the 903 drum storage site and windblown dispersion to the lip areas was detected at elevated concentrations in all the surficial samples and possibly in some of the deeper intervals. The concentrations of plutonium detected BH22 87 [0 9 foot duplicate at 63(14) pC1/g and the 10 foot sample at were 0 12(0 09) pC1/g] BH23 87 [0 8 foot at 1 1(0 2) pC1/g and 0 8 foot duplicate at 0 85(0 17) pC1/g] BH24 87 [0 2 foot at 96(4) pC1/g] BH29 87 [0 10 foot at 0 59(0 16) pC1/g] and BH30 87 [0 10 foot at 180(10) pC1/g and 10 foot at 0 33(0 16) pC1/g] The plutonium concentrations from soil composites that include the ground surface are significantly higher than the upper background level of plutonium 0 10(0 2) pCi/g The plutonium concentration from deeper intervals may not be statistically different from background The results indicate that plutonium contamination is indeed present in the vicinity of the 903 drum storage and lip sites but is probably confined to just beneath the surface Plutonium contamination also appears highest east of the 903 drum storage site Americium was detected at the concentrations of 0 93(0 26) pC1/g from BH22 87 (0 9 foot duplicate sample) 11(2) pC1/g from BH24 87 (0 2 foot sample) and 22(6) pC1/g in the 0.10 foot sample from BH30.87 concentrations detected for this radionuclide are well above the upper background level of 028(016) pC1/g Like plutonium americium is only truly elevated in soil samples where the compositing interval includes the surface. This indicates that americium contamination is also present in the vicinity of the 903 drum storage site

and is confined to just beneath the surface. As with plutonium the highest americium concentrations are east of the 903 drum storage site.

The only other radionuclides worthy of note are cesium 137 and strontium 90 Cesium was at the concentrations of 12(09) pC1/g from BH22 87 in the 22 foot bedrock sample and 16(08) pC1/g from BH29 87 in the 0 10 foot sample. It was otherwise not detected. The significance if any of the cesium concentrations is unknown because background data are unavailable for this radionuclide. Background data are also unavailable for strontium. Strontium was detected only in the 0 8 foot sample of BH23 87 at 11(05) pC1/g. However, this concentration is typical of strontium levels in other samples from boreholes at the Mound and East Trenches.

After a comprehensive review of the analytical results obtained from the soil boring program it appears that the 903 Pad Area is contaminated with plutonium americium and possibly phthalates. The plutonium and americium contamination which appears to be confined to the surface is not surprising considering the waste storage practices that took place at the 903 drum storage site. Soil contamination studies conducted by Rockwell (Rockwell International 1987a) have shown elevated plutonium concentrations downwind (to the southeast) of the 903 drum storage site. The plutonium concentrations found in surficial soils at the 903 drum storage site support the conclusion that the 903 drum storage site was the source of this contamination. Although phthalates were present in the blanks in many instances they occurred at significantly higher concentrations in the soil samples at depth. This suggests that phthalate is a contaminant of the soils at the 903 drum storage site and may provide a source for release to ground water but a definite conclusion cannot be drawn.

412 Solid Waste Management Unit 109 Trench T 2

Trench T 2 is located south of the 903 drum storage site. The orientation of this SWMU on Plate 4 1 is slightly modified from that shown on Figure 2 3 based on field reconnaissance review of historical aerial photographs and geophysical survey results. Drum lids are visible at the surface north of BH25 87 and buried metal (presumably flattened drums) was detected by the metal detection survey in the same area. The area containing buried metal appears to be the center of the trench based on historical air photos

Based on the documented disposal of sewage sludge and flattened drums contaminated with plutonium and uranium the most likely contaminants to be expected in the vicinity of the Trench T 2 area would be solvents chrome silver plutonium and uranium. Three boreholes were drilled to characterize the soils in the vicinity of Trench T 2. Borehole BH25 87 was placed adjacent to the center corner of the trench. Boreholes BH26 87 and BH27 87 were drilled just south and east of the trench respectively.

Soil gas results indicated moderate to high levels of PCE and TCE in the general vicinity of Trench T 2. In addition an isolated occurrence of CCl₄ at a low level was also found near the southeast end of the trench. Other volatiles were not detected in the soil gas near Trench T 2.

Analytical results from the samples collected from these boreholes indicate extensive organic contamination of the soils in the vicinity of BH25 87 (south of the trench) TCE appeared in all the samples collected from borehole BH25 87 ranging from 51 to 16 000 ug/kg. The highest concentration of 16 000 ug/kg was detected in

the bedrock sample 111 TCA was detected in the 18 foot and 20 foot bedrock samples taken from BH25 87 at the concentrations of 75J and 180J respectively Ethylbenzene and xylene were detected in the 0.9 foot 16 foot contact and 18 foot bedrock samples from borehole BH25 87 The concentrations of these compounds ranged from 11J to 780 ug/kg and 60 to 3 300 ug/kg respectively Toluene was also detected in the 0.9 foot sample (6J ug/kg) 9.10 foot sample (8J ug/kg) 16 foot contact sample (640 ug/kg) 18 foot bedrock sample (330J ug/kg) and 20 foot bedrock sample (300 ug/kg) from the same borehole PCE concentrations were also high in the bedrock ranging from 2100 to 10000 ug/kg. As discussed in the introduction to Section 4 other organics detected in the samples may not represent contamination because of their occurrence in laboratory blanks. However some of these possible lab contaminants appeared at significantly elevated concentrations in the samples relative to that observed in the blanks. For example acetone was detected at 1 100 ug/kg in both the 16 foot contact and 20 foot bedrock samples from borehole BH25 87 and never exceeded 90 ug/kg in the blanks Bis(2 ethylhexyl)phthalate was detected at 4 200 ug/kg in the 3 foot contact sample from BH26 87 and was detected at 1 100 and 1 900 ug/kg in the 0 9 foot composite sample and duplicate respectively from BH25 87 Bis(2 ethylhexyl)phthalate also occurred in two laboratory blanks at the concentrations of 2J and 31 ug/kg Because the concentrations of acetone and bis(2 ethylhexyl)phthalate in these cited samples are significantly greater than that found in the blanks their presence in the samples cannot be conclusively attributed to laboratory artifact. Also both compounds were known to have been stored at the 903 drum storage site. As the highest concentrations of these compounds occur in soils at depth the 903 drum storage site may be a source for releases of these compounds to ground water

Plutonium and americium were detected above background in the soil samples collected from these boreholes. Plutonium was detected at elevated concentrations in all soil composites that include the ground surface as follows. BH25 87 [3 2(0 4) pC1/g 0 9 foot duplicate sample] BH26 87 [83(2) pC1/g 0 3 foot sample] and BH27 87 [3 8(0 4) pC1/g (0 10 foot sample]. Americium was detected in the 0 3 foot [12(1) pC1/g] and 0 10 foot [0 44(0 5) pC1/g] samples from BH26 87 and BH27 87 respectively. These concentrations of plutonium and americium are significantly above the upper background levels of 0 10(0 20) pC1/g and 0 28(0 16) pC1/g for plutonium and americium respectively. Cesium 137 appeared in the 0 9 foot duplicate sample [1 4(0 8) ug/kg] and 2 foot sample [3 1(0 7) ug/kg] from BH25 87 Strontium 90 was always less than 1 1 pC1/g. The significance of the cesium and strontium concentrations is unknown because these background concentrations have not been characterized.

As expected the data indicate that soils in the vicinity of Trench T 2 are contaminated with plutonium americium solvents and possibly acetone and bis(2 ethylhexyl)phthalate. Plutonium and americium contamination is particularly high in composite soil samples that include the ground surface and solvent contamination appears highest south of Trench T 2 (BH25 87) in the bedrock. It is postulated that the radionuclide contamination originated from the 903 drum storage site via wind dissemination and the solvent contamination is due to a release from Trench T 2 as solvents were not present in the soils from boreholes upgradient of BH25 87. Alluvial ground water to the south of Trench T 2 (well 2 71) also has elevated levels of these solvents. The phthalate contamination may have originated from the 903 drum storage as this compound occurs at elevated concentrations in soils from borehole BH23 87 upgradient of this location. The acetone present in the soils may be due to a

release from Trench T 2 because acetone was not significantly elevated relative to the laboratory blanks in soils upgradient of Trench T 2

413 Solid Waste Management Unit 140 Reactive Metal Destruction Site

The reactive metal destruction site is located southeast of the 903 pad drum storage site and east of Trench T 2. The orientation of this SWMU was also revised slightly from that shown on Figure 2.3 based on field reconnaissance and a review of aerial photographs. The western portion of the site was roughly defined in the field by fence posts. Presumably a fence surrounded the site at one time. The eastern portion of the site was extended farther east than shown on Figure 2.3 after reviewing historical air photos.

The most likely contamination to be expected in the vicinity of the reactive metal destruction site would be lithium and solvents. Several boreholes were drilled to determine the exact nature of contamination present in the vicinity of this area. Borehole BH27 87 was drilled in the western portion of the site and BH26 87 was placed adjacent to the southwest corner of the site. Borehole BH24 87 was drilled adjacent to the northeastern corner of the destruction area. Data from these boreholes were discussed in the previous sections. BH28 87 was located approximately 50 feet southeast of BH24 87 and is discussed here.

Soil gas sampling and analysis indicated the presence of TCE and PCE at moderate to high levels in the general vicinity of the site. In addition carbon tetrachloride was detected at moderate levels adjacent to the northeastern corner of the site. No other organic compounds were detected in the soil gas samples.

As with Trench T 2 soil samples the data indicate definite solvent contamination of the soils and possible contamination with phthalates. The solvent contamination appears confined to the soils in the vicinity of BH28 87. Trans 1.2 dichloroethylene (t.1.2 DCE) chloroform (CHCl₃) TCE PCE CCl₄ and cis.1.3 dichloropropene were detected only in the soil samples from BH28 87 below the water table. T.1.2 DCE was at estimated levels of 8J and 10J ug/kg and chloroform was detected at estimated levels of 8J and 17J ug/kg. CCl₄ was detected in three samples at the concentrations of 29.50 and 100 ug/kg. TCE appeared at estimated levels of 5J 6J and 15J ug/kg. PCE was detected at concentrations of 14J 84 and 210 ug/kg. Cis.1.3 dichloropropene was detected only in the bedrock sample and was at an estimated level of 6J ug/kg. None of these organics were detected in the laboratory blanks.

Bis(2 ethylhexyl)phthalate was detected in a range from 970 to 3 400 ug/kg in all the soil samples from BH28 87. This compound was not present in the laboratory blank for this batch of samples and these concentrations are significantly elevated relative to concentrations in other blanks. Therefore it is probable that bis(2 ethylhexyl)phthalate is a contaminant of the soils at this borehole.

Plutonium was detected above background in the surface and 9 foot bedrock samples from BH28 87 Plutonium was 2 0(0 3) pC1/g in to 0 9 foot composite sample and 0 82(0 32) pC1/g in the 9 foot bedrock sample Cesium 137 was found at 0 3(0 17) pC1/g (0 9 foot sample) and 1 8(1 7) pC1/g (5 foot sample) in BH28 87 and strontium 90 was always less than 1 pC1/g Again the significance of the cesium and strontium concentrations is unknown as background concentrations have not been characterized

It is concluded that solvent and radionuclide contamination does exist in the vicinity of the metal destruction site. The radionuclide contamination generally appears to be confined to the surface. BH28 87 is the only area where radionuclides were found at deeper intervals. It is likely that radionuclide contamination had arisen from windblown contamination from the 903 drum storage site. Solvent contamination appears to be confined to bedrock material in the vicinity of BH28 87 and may represent a local release because solvents were not detected in upgradient soils from borehole BH24 87. There is also solvent contamination of alluvial ground water in this vicinity at well 1.71. On the contrary bis(2 ethylhexyl)phthalate is elevated in soils at BH24 87 suggesting the 903 drum storage site as the source of this contaminant.

42 MOUND AREA

The Mound Area is composed of 4 SWMUS

- o SWMU 108
- o SWMU 113
- o SWMU 153
- o SWMU 154

Presented below are the waste characterizations of these units

421 Solid Waste Management Units 108 Trench T 1, 153 Oil Burn Pit No. 2

Based on the waste management practices at the SWMUs it is expected that plutonium uranium and solvents would be the most likely contaminants present in this area. Four boreholes were drilled in the general vicinity of these SWMUs Borehole BH33 87 was drilled to the west of SWMU 153 and BH34 87 was drilled at the southwest corner of this SWMU. Borehole 36 87 was located just adjacent to the

northeast corner of SWMU 108 Borehole 35 87 was placed just south of SWMU 108 approximately 200 feet southwest of Borehole 36 87

Soil gas sampling found high levels of PCE present in the soil gas in the general location of SWMUs 108 and 153. An isolated moderate level of carbon tetrachloride was also detected. No 111 TCA DCE and TCE were found in the vicinity of SWMUs 108 and 153.

Analytical results indicated the presence of some HSL organics in the soil samples however the organics were likely introduced in the laboratory as discussed in the introduction to Section 4

Plutonium and to a lesser degree americium were elevated above background in the soils surrounding Trench T 1 Plutonium [15(02) pC1/g] and americium [04(019) pC1/g] were found in the 0 to 12 foot sample from borehole BH35 87 Plutonium was also found in the 05 foot sample from (borehole BH36 87) at a concentration of 053(016) pC1/g Cesium 137 was also found in this borehole at the 23 foot bedrock sample and 515 foot sample at concentrations of 23 pC1/g and 21 pC1/g respectively Strontium 90 was always detected at less than 11 pC1/g The significance of the cesium and strontium is unknown because background levels for these radionuclides have not been characterized

It appears that soil contamination in the vicinity of Trench T 1 is limited to plutonium and americium. As with the 903 Pad Area plutonium (and americium) contamination is probably confined to the near surface because elevated levels occur only in soil composites that include the ground surface. Concentrations of plutonium were not as high as at the 903 drum storage site which further suggest that historical windblown dissemination of radionculides from the 903 drum storage site as the

source of the contamination. The solvents detected in soil gas were not detected in the soils nor are they present in the alluvial ground water at well 43 86 [only a trace of CCl₄ (6 ug/l) and TCE (8 ug/l) was detected during the first quarter of 1987 and these compounds were not detected in the second quarter. It may be that the soil gas contaminants are originating from SWMU 113 as subsequently discussed

422 Solid Waste Management Unit 113 Mound Area

The mound site is located north of Trench T 1 and east of the Oil Burn Pit No

2 as shown on Plate 4 1 This location was revised during the remedial invsetigation
based on a review of historical aerial photography

Based on the waste management history of this area the most likely contamination would be uranium beryllium and solvents from lathe coolant Soil gas sampling found high levels of PCE present in the soil gas near the new location of SWMU 113. An isolated occurrence of TCE at a low level was also found approximately 100 feet southeast of borehole BH38 87. No other organics i.e. DCE 1 1 1 TCA or CCl₄ were detected in the soil gas in the vicinity of this site

Analysis of soil samples collected from both boreholes indicated the presence of some HSL organics however they occurred at estimated concentrations and/or were present in the laboratory blanks in a concentration on the same order as that seen in the laboratory blanks. However, bis(2 ethylhexyl)phthalate ranged from 2500 to 12 000 ug/kg in the 0.5 foot composite soil sample from BH37 87 and all the soil samples from BH38 87. These concentrations are significantly elevated above any observed blank concentration and therefore bis(2 ethylhexyl)phthalate appears to be present in the soil

Cesium was found in the 21 foot contact sample from borehole BH37 87 and 20 foot bedrock sample from borehole BH38 87 at concentrations of 47(04) pC1/g and 03(012) pC1/g respectively. The significance of these cesium concentrations is not known because background concentrations have not been characterized. Other radionuclides were not elevated above estimated background levels

It appears that bis(2 ethylhexyl)phthalate may be a contaminant in the soils of the mound site because it occurred in some of the samples at concentrations significantly greater than what was detected in laboratory blanks. The source of the PCE in the soil gas is contaminated alluvial ground water as PCE has historically been at significantly elevated levels at well 1.74. TCE has also been at high concentrations in the ground water in this vicinity even though it was only detected at low levels in the soil gas. SWMU 113 is likely the source of this release to ground water but confirmation will require further investigation.

423 Solid Waste Management Unit 154 Pallet Burn Site

This area is located west of the oil burn pit No 2. This SWMU was reportedly used to destroy wooden pallets in 1965. The types of hazardous substances and radionuclides that may have been spilled on these pallets is unknown. Two boreholes were drilled in the vicinity of this trench. Borehole BH32 87 was drilled adjacent to the southwest corner of the site and borehole BH31 87 was placed approximately 100 feet west of the southwest corner of the site.

Soil gas sampling indicated moderate levels of PCE in the vicinity of this site.

In addition an isolated low level of TCE was also found. No other organic compounds were detected in the vicinity of the trench during the soil gas survey.

Analytical results from soil sampling of boreholes BH31 87 and BH32 87 indicated the presence of low concentrations of HSL organics some of which may represent contamination 12 dichloroethane (12 DCA) was detected in all samples with the exception of the 16 foot bedrock contact sample from borehole BH32 87 in low concentrations ranging from 5J to 32 ug/kg PCE occurred in the 0 13 foot (16J ug/kg) and 13 foot (20J ug/kg) bedrock contact samples in borehole BH31 87 Toluene was detected only in the 16 foot bedrock sample from borehole BH31 87 at a concentration of 7J ug/kg Aroclor 1254 a PCB was detected at a concentration of 75 ug/kg in the 0 8 foot sample of borehole BH32 87 The low (generally estimated below detection limits) concentrations of these compounds suggest the soils may be slightly contaminated with solvents Little significance can be placed on this one time reported occurrence of Aroclor 1254

There is no apparent radionuclide contamination in the soils. Plutonium was detected at concentrations of 0.15(0.12) pCi/g (0.13 foot duplicate borehole BH31.87) and 0.33(0.17) pCi/g (0.8 foot sample borehole 32.87) however these concentrations may not be significantly higher (statistically) than background

In summary there is no significant contamination of soils at the pallet burn site. Very low (estimated below detection limits) concentrations of some HSL organics were detected.

43 EAST TRENCHES AREA

As discussed in Section 2 the East Trenches Area consists of nine burial trenches used for disposal of mainly flattened depleted uranium and plutonium contaminated drums. The trenches are designated T 3 (SWMU 110) and T 4 through

T 11 (SWMUs 111 1 111 8) and are located just east of the east guard gate at the security area. Trenches T 3 T 4 T 10 and T 11 are located to the north of the east access road and trenches T 5 T 6 T 7 T 8 and T 9 are located south of the road (Plate 4 1). Trench locations as shown on Figure 2 3 were verified and modified slightly based on the magnetometer survey (Appendix B) and field reconnaissance. The only significant location change was Trench T 8 which was moved south approximately 75 feet.

431 Trench T 3 (SWMU 110)

Solvents (from lathe coolant) plutonium uranium silver (from sewage sludge) and chrome (from sewage sludge) are the contaminants that would most likely be expected in the vicinity of Trench T 3. Boreholes BH39 87 and BH40 87 were drilled to characterize these soils. BH39 87 is approximately 50 feet south of Trench T 3 while BH40 87 is adjacent to the northeast corner of the trench

In the vicinity of these boreholes there were several locations with moderate levels of PCE and one location with a low level of TCE in the soil gas. Other volatiles were not detected in the soil gas.

As discussed in the introduction to Section 4 chemical analyses of the samples collected from both boreholes shows the presence of organic contaminants but it appears these contaminants may have originated in the laboratory. The presence of these organic compounds in either the laboratory blanks for this batch of samples or in other blanks at similar concentrations and the fact that these organics are common laboratory contaminants suggest that they are not present in the soils in the vicinity of Trench T 3. The source of the PCE and the TCE detected in soil gas is alluvial

ground water in the vicinity of the trench as evidenced by the data for well 3 74.

The source of release of these compounds to ground water may be Trench T 3 but confirmation will require further investigation.

There was only one occurrence of radionuclides above background in the soil samples from these boreholes. Plutonium [1 1(0 2) pC1/g] was detected above background only in the 0 2 foot sample from BH39 87. This appears to be significantly above background as the upper limit of the background range is 0 10(0 20) pC1/g. Strontium 90 was always less than 1 1 pC1/g and cesium 137 was not detected in the samples

It is concluded that with the exception of plutonium in the 0.2 foot sample from BH39 87 there is no apparent soil contamination in the vicinity of Trench T 3. The high plutonium concentration in the surficial material at BH39 87 may be characteristic of the general vicinity of Trench T 3 but there are inadequate data to support this conclusion (no surficial data for BH40 87). The plutonium contamination likely has arisen from wind blown dissemination of plutonium from the 903 Pad Area. Although alluvial ground water in the vicinity of Trench T 3 is contaminated with solvents soils from boreholes BH39 87 and BH40 87 do not show such contamination.

432 Trenches T 4, T 10, and T 11 (SWMU 111.1, 111.7, and 111.8)

Like Trench T 3 contaminants at Trenches T 4 T 10 and T 11 should include solvents plutonium uranium silver and chrome There were six boreholes drilled in the vicinity of these trenches to characterize soil contamination BH 41 87 and BH42 87 are approximately 200 feet to the northeast and east respectively from Trench T

that appears to exist is at relatively low levels. However as with Trench T 3 alluvial ground water is contaminated with solvents which is the likely source of TCE and PCE detected in the soil gas. A determination of the extent to which Trenches T 4 T 10 and T 11 are the source of this release to ground water will require further investigation.

433 Trenches T 5 through T 9 (SWMUs 111.2 111.6)

Based on historical waste management practices at these trenches solvents uranium and plutonium are the contaminants that may be expected in the soils Boreholes BH47 87 through BH55 87 were drilled in the vicinity of the trenches to characterize any soil contamination BH47 87 BH53 85 BH55 87 and BH56 87 are north of the trenches while BH48 87 BH49 87 BH50 87 BH51 87 BH52 87 and BH54 87 are to the south

In the vicinity of all the trenches to the south of the east access road PCE TCE and 1 1 1 TCA were detected in the soil gas at several locations PCE was most pervasive generally occurring at low levels with one moderate level near BH50 87 TCE and 1 1 1 TCA was sporadically present at low levels

Similar to the findings for the trenches to the north of the east access road methylene chloride. N nitrosodiphenylamine di n octyl phthalate and bis(2 ethylhexyl)phthalate occurred in most of the samples but were also present in most of the laboratory blanks in concentrations of the same order of magnitude. However acetone was pervasive in the soils at concentrations often greater than three times that observed for laboratory blanks and sometimes an order of magnitude greater. The acetone ranges in the soils are summarized below.

<u>Borehole</u>	Concentration Range (ug/kg)	Comment
47 87	8J 820	Higher concentrations below 16 depth
48 87	100 1200	Highest concentration at the 13 contact
49 87	91 710	Occurs throughout the borehole
50 87	510 1000	Occurs throughout the borehole
51 87	72 1700	Occurs throughout the borehole
52 87	43-94	Occurs throughout the borehole
53 87	58 130	To a depth of 8
53 87	430 2400	Below 8
54 87	29 1600	Occurs throughout the borehole but is generally 200 300 ug/kg
55 87	300 1200	Occurs throughout the borehole
56 87	74 120	Only detected below the water table

It appears from the above data that there may be acetone contamination throughout the soils in this area with the highest concentrations occurring at depth. This implies a plume of acetone exists possibly originating from these trenches however concentrations of acetone in the low hundreds ug/l also exist in the soils in the vicinity of the trenches to the west which may indicate yet another source of acetone

1 2 DCA appeared in many of the samples from the boreholes was frequently at concentrations above detection limits and never appeared in the blanks. The only borehole where 1 2 DCA did not appear was BH56 87 which is furthest from the trenches to the north. The lowest concentrations were at BH51 87 and BH54 87 located adjacent to Trench T 8 which is the trench furthest to the south. These concentrations were estimated values below detection limits. The 0 2 foot sample from BH54 87 had 120 ug/kg of 1 2 DCA and 190 ug/kg of toluene. This sample and the 8 foot sample in BH54 87 are the only occurrences of toluene in any sample from boreholes in the east trenches area. Samples from BH53 87 also had 1 2 DCA

concentrations near or below detection limits. Except for BH56 87 BH53 87 is furthest from the trenches to the north. All other boreholes are located adjacent to trenches T 5 T 6 T 7 and T 9 immediately to the north and south. Generally the highest concentrations of 12 DCA were found in BH47 87 BH56 87 and BH50 87. Concentrations of 110 and 98 ug/kg were present in 15 foot bedrock contact and 17 foot bedrock samples of BH50 87 (just south of Trench T 7). Concentrations ranged from 38 120 ug/kg in the 7 samples taken from the bedrock contact and bedrock materials from BH47 87 (just north of Trench T 9) and BH55 87 (just north of Trench T 5). Like acetone there appears to be a release of 12 DCA to alluvial ground water in the vicinity of these trenches.

At the time of this writing radiochemical results are only available for BH47 87 BH53 87 and BH56 87 Soil samples from BH47 87 and BH56 87 had radionuclide concentrations within background levels. The 0.2 foot and the 2.3.5 foot soil samples from BH53 87 contained plutonium at 6(0.2) pC1/g and 0.98(0.24) pC1/g respectively. In all samples strontium was less than 0.5(0.6) pC1/g and cessum was 0(0.1) except one occurrence of cessum at 0.1(0.1) pC1/g. As with other sites, the high plutonium in the upper soils suggests the contamination arose from wind blown dissemination of plutonium from the 903 drum storage site.

It is concluded that contamination of soils in the vicinity of the trenches south of the east access road is limited to plutonium 12 DCA and possibly acetone. Other HSL organics that were detected likely represent laboratory artifact. The 12 DCA contamination appears to be confined to the bedrock material and plutonium contamination appears to be confined to the surface. The highest concentrations of acetone were also at depth.











